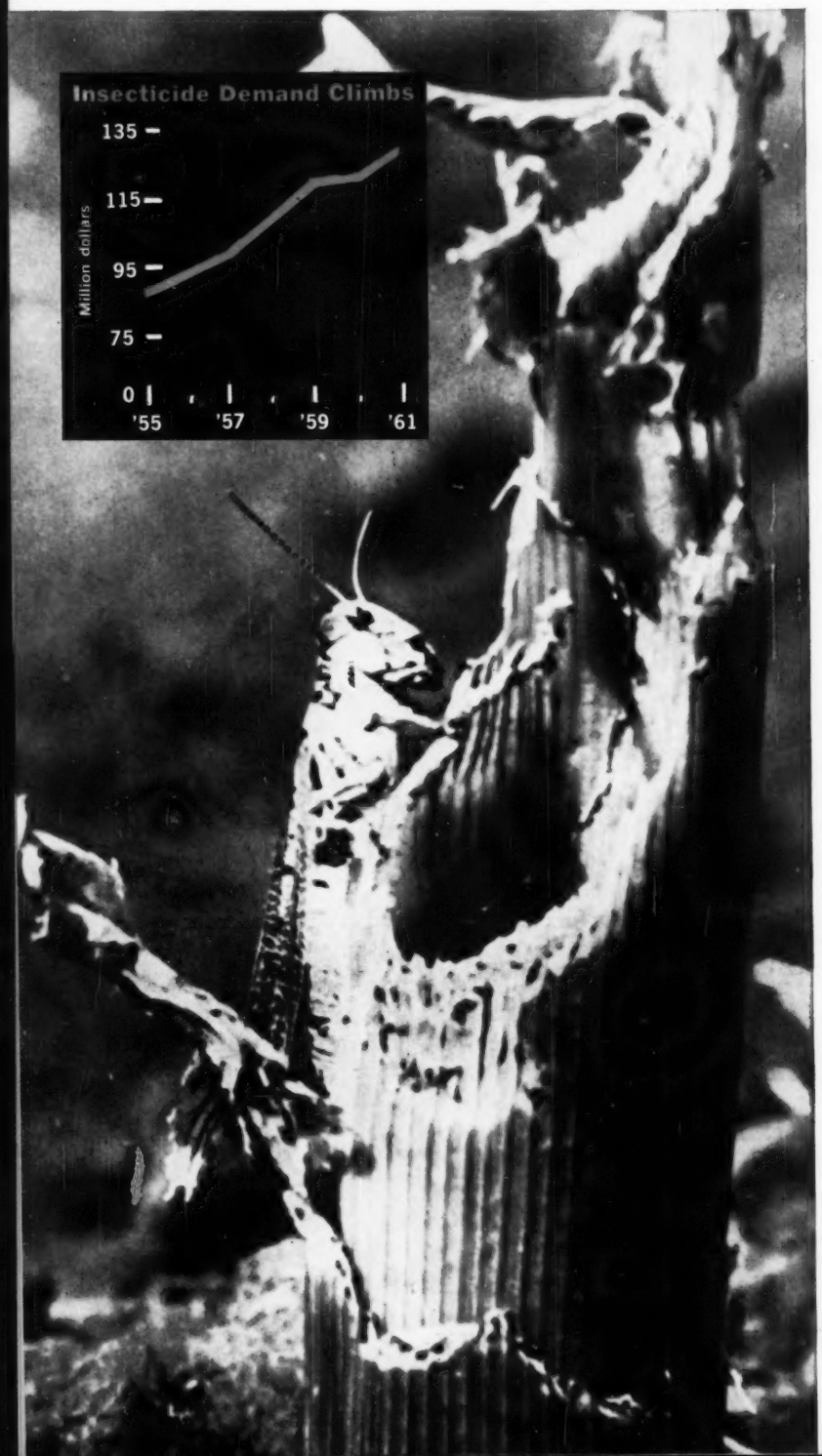
JULY 22, 1961

Chemical Week

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New labeling rules under fire by CPI. The charge: 'too far, too fast' . . . . . p. 25

Peroxides prosper. New organics cash in on growing use in plastics . . . . . p. 39

Stainless price rise. How will it affect chemical process equipment? . . . p. 51

Floor polish with a difference: detergents don't dull the shine . . p. 79

BUMPER BUG CROP BOOSTS PESTICIDE SALES . . . . . p. 95

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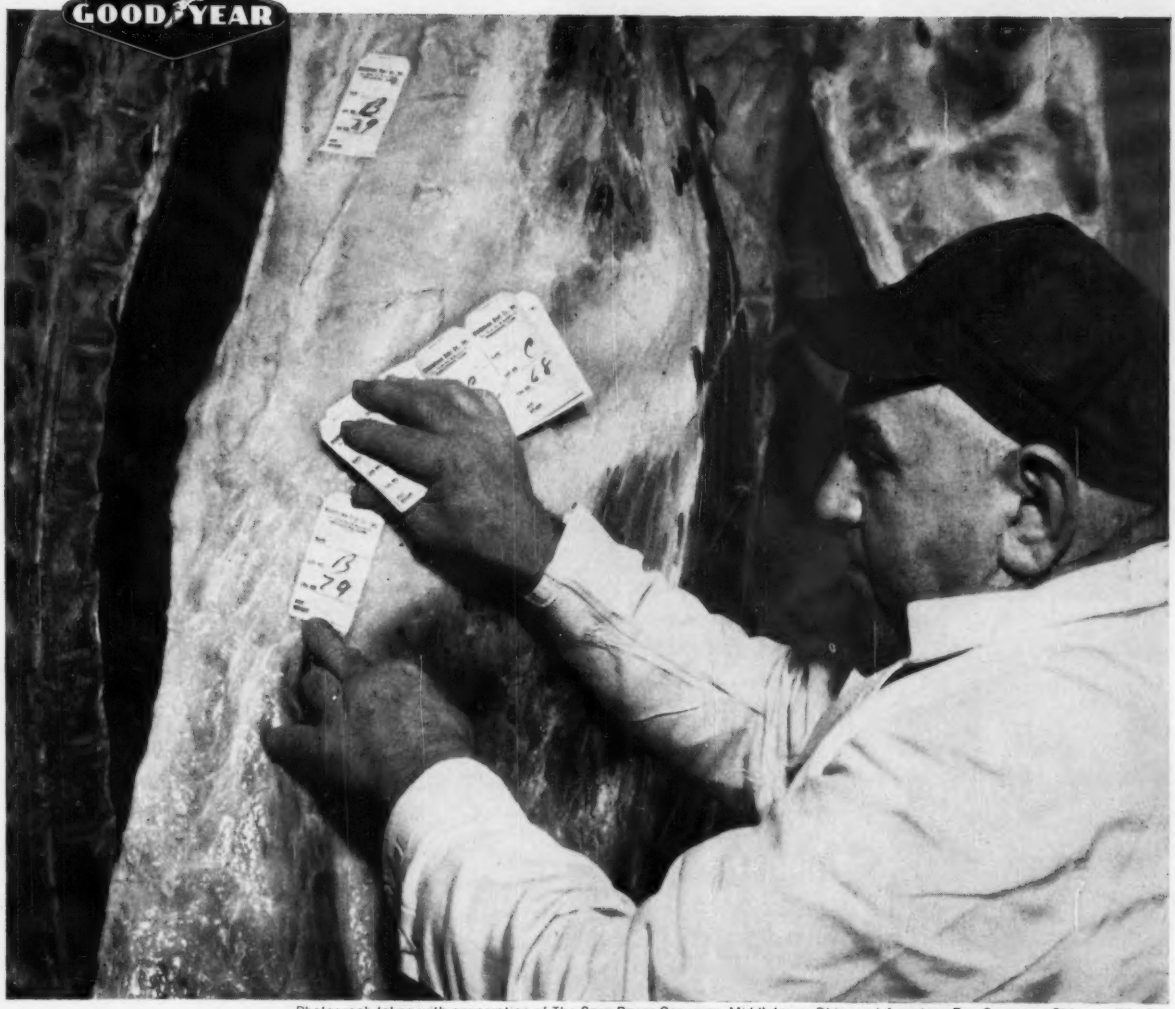
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ON THE COVER: Grasshopper finishing off this cornstalk in a Burleigh County, N.D., field epitomizes infestations that are spurring insecticide sales in many parts of U.S. (p. 95).

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Neutral Head, Western Heart

These final observations of the European scene were written by CW Editor-in-Chief Johnson as he prepared to return to New York.

Stockholm—It seems strange that this most American of European cities, where teenagers munch hot dogs and buy rock-and-roll records, should be the capital of a fiercely neutral country. But Sweden is neutral for us rather than against us. Its head dictates neutrality and trade with Russia, but its heart is with the West. It's a country of peace—it hasn't warred since Napoleonic times—and of peacemakers, like UN Secretary-General Dag Hammarskjold and the late Count Bernadotte.

Sweden's abundant forests are far more impressive than its chemical industry. Lacking petroleum resources, it imports crude oil for its four refineries, thus has little raw material for a petrochemical industry. Unlike the underdeveloped nations that are long on raw materials but short on skills and capital, Sweden must import many raw materials, sell manufactured goods. Known throughout the world are Swedish ball bearings, glassware, steel and business machines.

Hence the trade with Russia. Faced with the necessity of keeping exports at competitive prices while paying wages among the highest in Europe, Sweden has grasped at the chance to buy Soviet fuel oil at a 15% lower price to fuel its factories; Russia's share of the Swedish fuel oil market was 12% in '58, 40% today. As Sweden's petrochemical industry develops, it may well be based on Russian crude, pipelined from the Urals to Latvia and Lithuania and then shipped across the narrow Baltic Sea.

Potent Third Force

It seemed strange indeed to see German flags flying over the Place de la Concorde just 16 years after the end of bitter, violent World War II. They were there to welcome West German President Heinrich Luebke as he came to Paris to confer with President Charles de Gaulle.

This was a symbol of the unity that began to pervade Western Europe shortly after two devastating wars in this century had taught the folly of any lesser approach. There was much doubt that the Iron and Steel Community, the first step toward integrated economy, would work. It not only worked but also paved the way to closer cooperation in other organizations, culminated by the Common Market. Even this is in an early stage of evolution, and we can reasonably look toward a larger membership therein and a still closer integration of the separate national economies.

Looking at Europe today, we realize that our own Founding Fathers built more wisely than they knew when they forbade restrictions on trade between the several states. By creating one vast market, they gave commerce and industry room to stretch and grow. The dream of a similar United States of Europe is not likely to be fulfilled in our lifetime, but every step in that direction helps to weld together a potent third force in a world torn between two economic giants, the U.S. and the U.S.S.R. With its 280 million people, an integrated Europe—with no barriers to movement of labor, capital, materials, and manufactures—could prove that its progress to date is only a beginning.



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Bechtel the Builder

TO THE EDITOR: The news item (*June 17, p. 68*) is in error concerning responsibility for the 50-million-cu.ft./day hydrogen plant to be built as part of Tidewater's Avon, Calif., Isocracker.

Bechtel Corp. is solely responsible for this hydrogen plant, as it is for the entire project, and is utilizing the services of Selas Corp. as the supplier of the steam methane furnace. . . .

FRED W. MEYER
Vice-President, Engineering
Refinery & Chemical Division
Bechtel Corp.
San Francisco

Boycott the South?

TO THE EDITOR: I congratulate William P. Cooke for his letter (*June 24, p. 9*) pointing out the hostile picture the South paints of itself to those contemplating a move into the area. His is a statement that should have been made long ago.

While it would be naive to believe that the chemical industry would make any substantial changes in the prevailing attitudes by taking the stand he suggests, the only moral stand for it to take is to make no inroads into the South until these attitudes change. This may take quite a long time.

Perhaps the wait will be shortened just a bit by industries looking to other areas for the building of expansion facilities. No honest person could deny that much shameful segregation exists outside the South, but this same honesty must make him admit that there the practice is at its worst.

One very important factor was omitted by Mr. Cooke. Many people, regardless of race, feel that an area where segregation is the prevailing custom, if not the actual law of the land, is no place to raise children. This fact alone is going to keep a lot of good men out of the South, whether new plants move there or not.

I hope Mr. Cooke's letter will stimulate more discussion on this very important problem.

M. FRANK LEVY
St. Albans, N.Y.

Information Retrieval

TO THE EDITOR: Although distressed by your egregious encomium to Gene Garfield's *Index Chemicus* and especially by the invidious comparison with *Chemical Abstracts*, I appreciate the increasing interest being taken in the desperate state of information-fetching as represented in your article (*July 8, p. 75*). The note you wrote about the cost per year might be rather misleading as well. It may interest you to learn that "coordinate indexing" is so widely used now as to be a commonplace. Uniterm indexing and its mechanical congeners are well advanced.

Even though some companies spend as much as 10% of their research budget on information services, this ought not cause you to ignore the possibility that much of these pecuniary resources are being dispersed footlessly in empire building. The measure of a good information man lies not in how much of the budget he can wheedle but in how much he can do with how little.

FRANK S. WAGNER, JR.
Technical Librarian
Celanese Chemical Co.
Research and Development Dept.
Clarkwood, Tex.

Objects to Bomb Tests

TO THE EDITOR: Your boiling down of the arguments against resumption of U.S. nuclear tests (*Viewpoint, July 8*) is like saying that the arguments against nonimprisonment of murderers boil down to mere worry about personal safety. In addition to the objections you list, there is also a moral concern, although admittedly few, even among church members, share this concern.

Aside from the moral aspects, I fail to see how resumption is practical. If these bombs are intended only

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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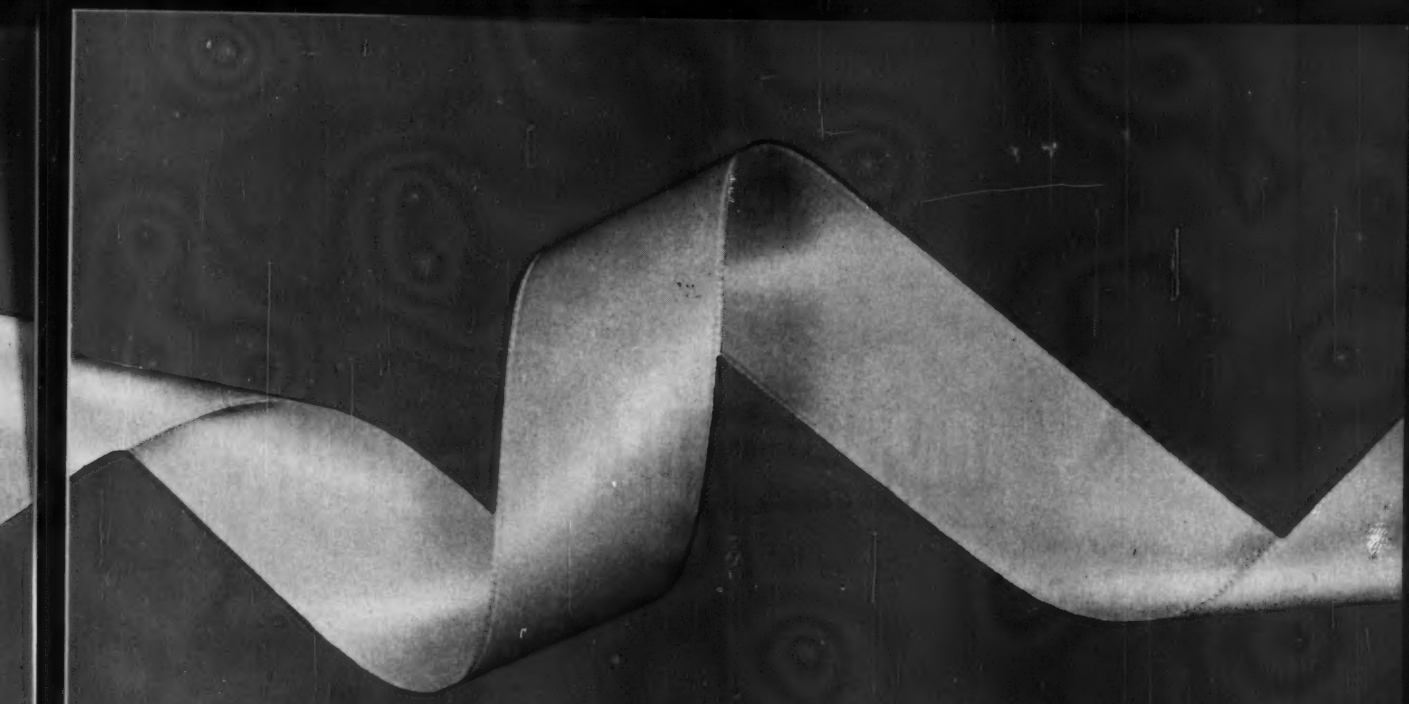
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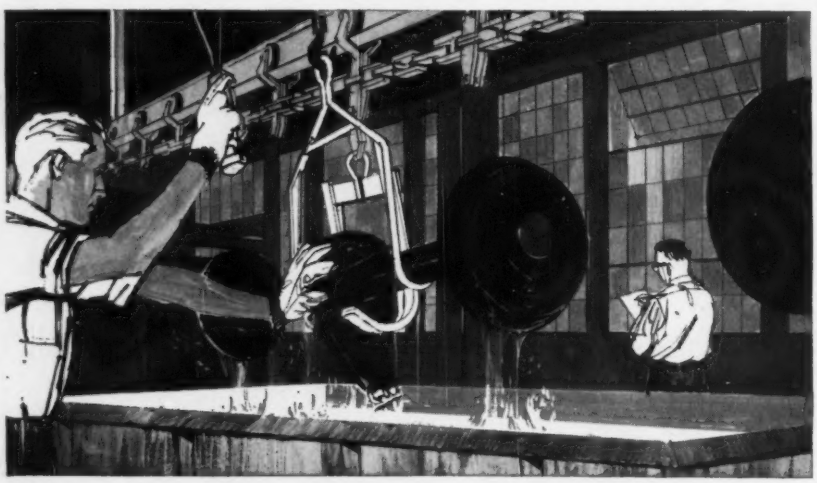
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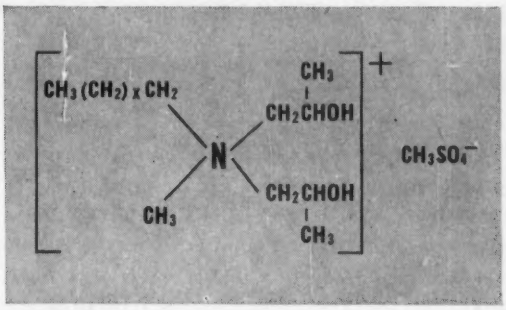


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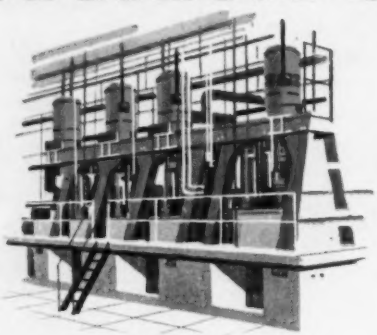
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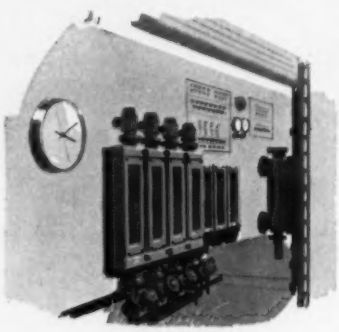
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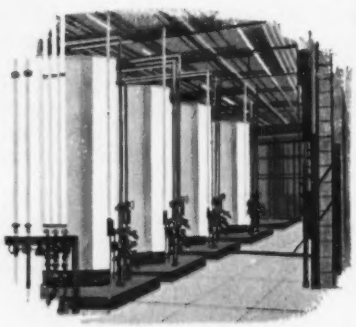
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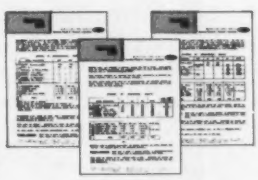
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as a threat, knowing that use will result in mutual destruction, what does it matter whether they are "clean" or "dirty", if we already have enough to destroy Russia many times, as is apparently the case?

And why are we about to have an exception to the tried and proved rule that arms races result in war, not peace? Dr. Thomas says "history shows us that the correct way of preventing war is to be strong." Hasn't this been true provided the strength was concentrated in one alliance, not almost evenly split between enemies?

JOHN P. SNYDER
Chemical Engineer
Madison, N.J.

Gulf Not in Coal

TO THE EDITOR: The following is a quotation (*Technology Newsletter, June 10*) summarizing a statement attributed to Anton Zischka in a recent talk at Essen: "Gulf Oil has a big share in the coal industry and has worked up coal gasification and liquefaction processes that he implies are ready to compete with oil-based processes for turning out gasoline and gas." Purpose of this letter is to deny categorically that Gulf Oil Corp. "has a big share in the coal industry" or that it plans commercial application of coal gasification and liquefaction processes. . . .

BLAINE B. WESCOTT
Vice-President Gulf Oil Corp.
Pittsburgh, Pa.

Hercules' PP Capacity

TO THE EDITOR: . . . A report (*June 24, p. 48*) [said] that Hercules was operating a 20-million-lbs. plant for making Pro-fax at Parlin, N.J.

Your April 22 issue carried an extensive (and excellent) article on the opening of our 60-million-lbs. Profax plant at Lake Charles, La. This plant is already being expanded to 120 million lbs.

We would very much appreciate your published recognition of our position as the first and largest polypropylene producer. We are, and intend to remain, the world's leader in polypropylene.

R. D. ULLRICH
Cellulose Products Dept.
Hercules Powder Co.
Wilmington, Del.

MEETINGS

Gordon Research Conferences, July 24-28; Colby Junior College, New London, N.H.—corrosion oxidation of metal surfaces; New Hampton School, New Hampton, N.H.—organic reactions and processes; Kimball Union Academy, Meriden, N.H.—chemistry at interfaces; Tilton School, Tilton, N.H.—biochemistry and agriculture.

American Oil Chemists' Society, short course on "Newer Lipid Analyses," University of Rochester, July 23-26.

University of California at Los Angeles, "Statistical Methods in Industry," annual program, UCLA campus, July 31-Aug. 11.

Case Institute of Technology, digital-control systems course, Cleveland, July 31-Aug. 11.

The Chemical Institute of Canada, 44th Canadian Chemical Conference and Exhibition, Queen Elizabeth Hotel, Montreal, Aug. 3-5.

18th International Congress of Pure and Applied Chemistry, Montreal, Can., Aug. 6-12.

Western Resources Conference, "Land and Water Planning for Economic Growth," Colorado State University, Fort Collins, Colo., Aug. 7-11.

International Congress of Pure and Applied Chemistry (18th), University of Montreal, Montreal, Can., Aug. 12-16.

Technical Assn. of the Pulp and Paper Industry, Wood Chemistry Committee, 1961 Lignin Symposium, Edgewater Beach Hotel, Chicago, Aug. 14-16.

University of Michigan, Cryogenic Engineering Conference, Ann Arbor, Mich., Aug. 15-17.

Technical Assn. of the Pulp and Paper Industry, 12th testing conference, Queen Elizabeth Hotel, Montreal, Que., Aug. 15-17.

Second International Electronic Circuit Packaging Symposium, University of Colorado, Boulder, Aug. 16-18.

United Nations Conference on New Sources of Energy, Ciro Massino, Rome, Italy, Aug. 21-31.

Wayne State University, international conference on coordination chemistry, Detroit, Aug. 21-Sept. 1.

Western Electronics Show and Conference, Cow Palace Hotel, San Francisco, Aug. 22-25.

Mathematical Assn. of America, summer meeting, Oklahoma State University, Stillwater, Aug. 28-31.

American Society of Mechanical Engineers, international conference on heat transfer, University of Colorado, Boulder, Aug. 28-Sept. 1.



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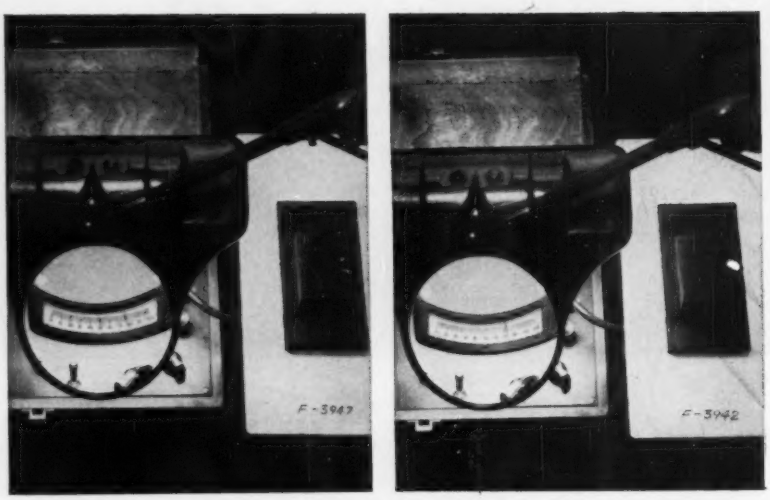
ACRYLIC FORMULATORS:

Shell Chemical's new Pent-Oxone* and Pent-Oxol* high boiling solvents give you flexibility never before possible in high-low solvent systems for acrylic lacquers

New Pent-Oxone solvent is Shell's remarkable keto-ether. New Pent-Oxol solvent is a glycol ether.

Both are true high boilers which impart gloss to acrylic lacquers. They virtually triple the number of effective acrylic solvents you can choose from in the high boiling range.

For details, see below—and send for Shell's new technical bulletins.



Unrubbed acrylic lacquer with Shell's Pent-Oxone solvent, left, gives greater gloss reading (77) than identical formulation with equivalent amount of EGMEE acetate (72). Pent-Oxol solvent gives similar high gloss levels in acrylic lacquers.

As YOU KNOW, high-low solvent systems for acrylic lacquers place a heavy burden on high boiling solvents. For years, ethylene glycol monoethyl ether acetate has carried most of this burden alone.

Now, Shell Chemical has developed two new high boilers which lighten this load and give you a flexibility which has hitherto been missing in acrylic lacquer formulation.

Solution viscosity data

Both Pent-Oxone and Pent-Oxol solvents are highly active. Here is how they compare with EGMEE acetate in solution viscosity (cps.) for three widely used Rohm & Haas acrylic resins:

	A-21	B-44	B-66
Pent-Oxone solvent	22	20	15
EGMEE acetate	26	23	16
Pent-Oxol solvent	30	25	25

All three resins were reduced to 15 per cent by weight as follows: A-21 with 45 parts toluene, 5 parts butyl alcohol and 50 parts indicated solvent; B-44 with 26.5 parts toluene and 73.5 parts solvent; B-66 with solvent alone.

Gives high gloss levels

Acrylic lacquers using Pent-Oxone or Pent-Oxol in the solvent system are characterized by gloss levels higher than can be obtained from any other high boiler at equal concentration.

These gloss levels *remain* high under a wide variety of application conditions, such as force dry time and temperature, spray room temperature, topcoat thickness, primer smoothness, pigmentation and operator efficiency.

This feature readily translates into lower manpower and elapsed-time costs in rubbing operations.

New technical bulletins

New technical bulletins are available from Shell on Pent-Oxone and Pent-Oxol solvents. Bulletin A deals with the physical properties of these products. Bulletin B deals with their use in acrylic lacquers.

For these bulletins, plus samples of Pent-Oxone and Pent-Oxol solvents, write to any of Shell's 9 Industrial Chemical Division offices or directly to Shell Chemical Co., 110 West 51 Street, New York 20, New York.

*Trademark, Shell Chemical Company

A Bulletin from

Shell Chemical Company

SHELL

Industrial Chemicals Division

Business Newsletter

CHEMICAL WEEK
July 22, 1961

Surging sales have checked the fall in chemical earnings.

Operating data from three of the top 10 chemical companies indicate that the industry's pattern will be something like this: second-quarter sales up about 10% over first-quarter levels, and net income up 25% or more.

For Du Pont, second-quarter sales mounted to $563 million—a new three-month record for the company. This was just a shade higher than the $562 million in last year's second quarter, but nearly 10% higher than the $513 million sales in this year's first quarter. Six-month sales of $1,076 billion were off 2% from last year's first half. Earnings on Du Pont's operating activities in the second quarter were about 5% less than in the year-ago period; but this was a nearly 25% improvement over first-quarter performance. Over the full six months, operating earnings of $2.73/share were down 10.5%.

Allied Chemical's May and June sales were at record levels; but during the second quarter, volume of $211.3 million fell 2.5% short of the year-ago peak. First-half sales were down 5%, to $379.9 million. Earnings in May and June nearly equal those in the corresponding months of '60; and second-quarter net of 81¢/share was up 72% from the first-quarter low. Over the entire first half, earnings were off 17%, to $1.28/share.

Hercules Powder scored an impressive 10.7% gain in second-quarter sales, hitting a new record of $93.3 million. First-half sales were up 9.3%, to $182.2 million. And while second-quarter earnings were down 3.5% from a year ago, to 84¢/share, they were up 36% over the first-quarter net.

•

Output of Stauffer's West Coast chlorine plant will be captive. The multimillion-dollar unit, set for completion at Dominguez, Calif., by third-quarter '62 (*CW, Aug. 6, '60, p. 25*), will pipe chlorine to American Chemical (Long Beach, Calif.), which is jointly owned by Stauffer and Richfield Oil. No output figures were revealed, but it will probably be near 50 tons/day of chlorine.

Industry speculation is that caustic soda will be processed at Stauffer's fusing facilities, also in Dominguez, and that Stauffer subsidiary A. R. Maas (Southgate, Calif.) will absorb caustic potash output.

•

Spencer Chemical is integrating vertically. It has bought two plastic film companies (converters, not extruders): Tube Corp. (Chicago), and Flexicraft Industries (New York), This will give Spencer a better

Business Newsletter

(Continued)

feel of the market—an important point in the current price-cutting plastics situation. Spencer will be able to tell quickly which grades of polyethylene are being bought by film sellers, save money by not producing the wrong grades. CHEMICAL WEEK estimates that the combined sales of the two acquisitions is about $5 million/year. Spencer paid about $2 million for Crystal; there's no figure for Flexicraft.

•

Other news notes this week: Pfizer will issue about 300,000 shares of common stock to acquire New England Lime Co. (Adams, Mass.) and its subsidiary, Nelco Metals (*CW Business Newsletter, April 29*). Humble Oil will boost capacity of its polyolefin plant at Baytown, Tex., 50%, to 60 million lbs./year, then to 80 million by late '62.

•

Prospects for Britain joining the European Common market are dimmer now than they were a few weeks ago, when Prime Minister Macmillan seemed on the verge of announcing his country's bid for membership. Negative reactions from Britain's Commonwealth partners —particularly Australia and Canada—have been stronger than expected, stirring political opposition to EEC membership within the U.K.

The Commonwealth nations are worried about losing trade advantages with Britain—primarily in agricultural products—and insist that special dispensations be granted them if Britain joins the Common Market. But France is dead set against making any such concessions. One British expert pegs Britain's chance of being accepted by the Common Market—if it asks to get in—at no better than 4-in-10.

•

Watch for more Italian chemical investments overseas. Montecatini will reportedly invest in Mexico's Tlaxcala State. And ENI, the Italian state-owned trust, has signed an agreement with India to build petroleum and petrochemical plants there and to supply oil exploration materials. It calls for ENI and other Italian firms to send India $100 million worth of labor, machinery and materials.

•

Almost all French man-made fiber production will be controlled by Rhone-Poulenc as a result of its projected take-over of Celtex and the latter's 50% interest in Rhodiaceta, of which Rhone-Poulenc already owns half (*CW Business Newsletter, July 8*). The deal will give Rhone-Poulenc control over production of all French polyamides, polyesters and acetates, and some 90% of rayon and staple fiber and yarn production. It will also have chunk of French acrylic fiber production.

•

Reichhold will merge its Japanese affiliate with Dai Nippon Ink Co., if current plans work out. Dai Nippon has chosen the merger route to modernization in preparation for its move into Goi petrochemical center in the fall of '62.

☆☆☆☆

4-STAR COMMERCIAL

about CELANESE INTERMEDIATES

TRIMETHYLOLPROPANE

A good base to start from. Celanese trimethylolpropane is making life easier for manufacturers of polyurethane foams and alkyd paints. Used as a base for polyethers in urethane foam production, TMP imparts improved toughness and heat distortion points, as well as better chemical resistance. As a component in alkyd coating resins, trimethylolpropane increases hardness, flexibility, color retention and resistance to heat and chemicals. And its price is very realistic.

ACRYLATE ESTERS

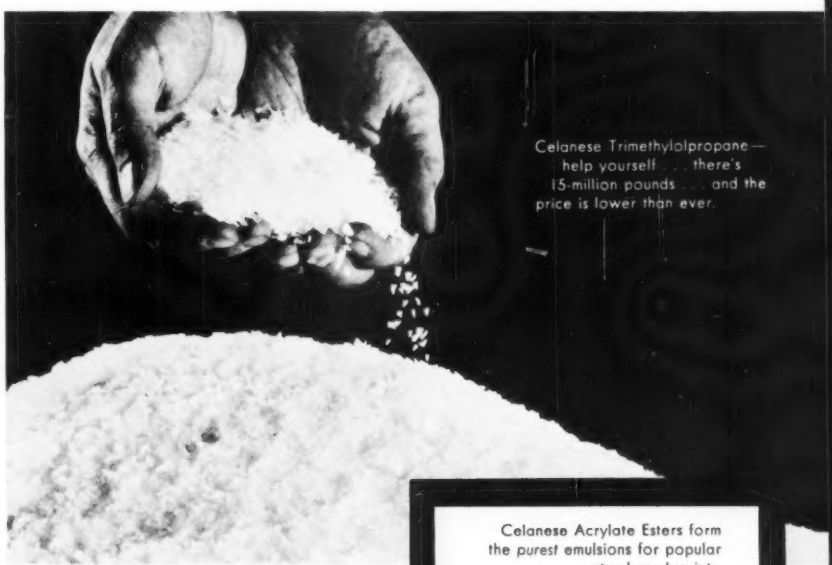
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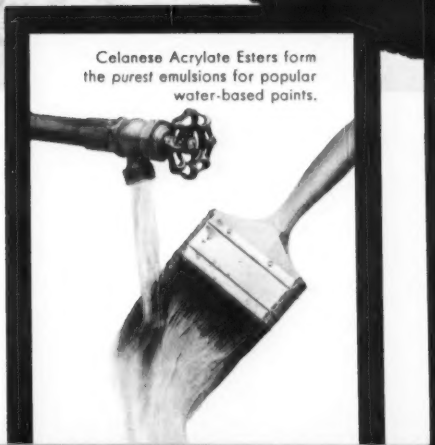
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2-ETHYLHEXANOL

Quality tells. Celanese is now producing this intermediate with *outstanding quality*—in commercial quantities. Plasticizer manufacturers are using 2-ethylhexanol widely for making DOP or bis (2-ethylhexyl) phthalate. It is also used as a component for surfactants, herbicidal formulations, and in applications utilizing its defoaming characteristics. 2-ethylhexanol is used in the manufacture of Celanese 2-ethyl hexyl acrylate, noted for high-purity.





For more information on any of these Celanese intermediates, mail the coupon on the reverse side of this page.

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Incidentally, paraformaldehyde is one of the most uninhibited chemicals around. Side reactions and resin yield losses are held to a minimum because paraformaldehyde contains no side agents or inhibitors. Which is not to say that Para isn't budget conscious. It is. For one thing, it can be stored in facilities that cost a fraction of what specially insulated storage tanks for formalin do. And it keeps a sharp eye on utility bills, too, since its shorter processing time requires less steam, power and water consumption.

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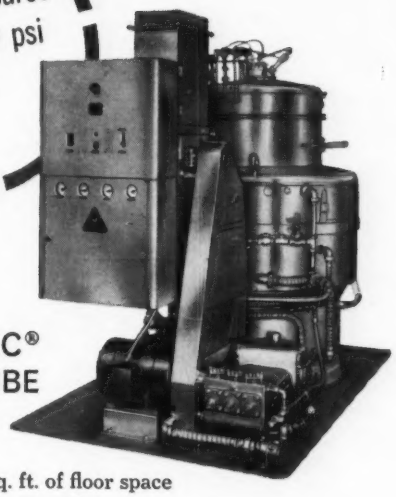
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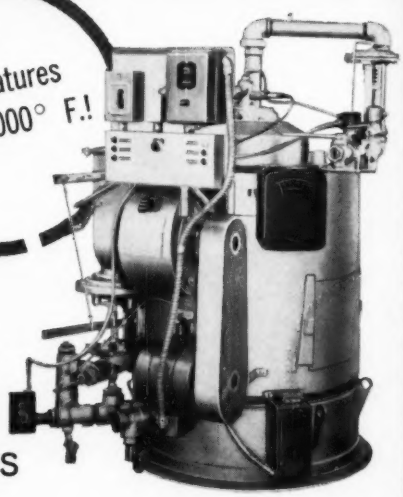
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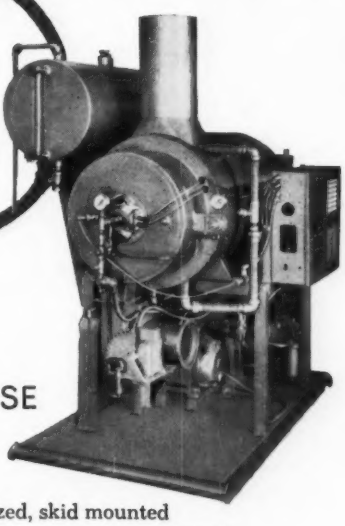
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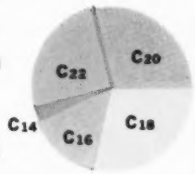
Reduce Your Production Costs with ADM Chemicals that Focus on Function

If finding the best chemical for a specific function is your job, ADM can help. Our technical knowledge and uniquely functional chemicals are helping manufacturers in virtually every field and phase of industry improve their products, production and profits.

Perhaps you need a chemical that inhibits steel-eating bacteria, is odorless and stays in solution in spite of heavy water evaporation. A plasticizer that ends the problem of exudation, or a fluid that maintains a constant viscosity under extreme temperatures. A plastic laminating resin that wets fiberglass 10 times faster than the one you're now using, or a coating resin that eliminates efflorescence in Florida.

ADM has specialized chemicals that focus on these specific functions . . . and countless more.

Better Corrosion Control and Easier Handling With New Beaded AB Amine



Looking for a more effective film-forming chemical to control metal corrosion? New Adogen 101D distilled primary amine offers two important advantages: Handy-to-handle beaded form and a long fatty alkyl chain mix of C_{20} and C_{22}.

This high content of long chain arachidyl-behenyl amine gives superior corrosion inhibition. Thus, Adogen 101D is highly effective in boiler water treatment formulations. Its functional qualities also suggest its use as a redispersant in pulp and paper processing and in mineral beneficiation. *Contact the ADM Specialty Chemicals Department.*

Fluid Form, Economy Distinguish New Adogen Tall Oil Fatty Amine

Could a highly functional, more economical fluid fatty amine help you profit? If so, Adogen 151 can. It costs substantially less than semi-solid soya or cottonseed based amines. And because of its high unsaturation, this tall oil fatty acid amine flows freely at room temperature for fast, convenient handling.

Adogen 151 is an excellent ore flotation agent. We also suggest you evaluate it for gasoline de-icer and anti-sludge additives, industrial sanitizers and other applications that call for an economical selective film-forming cationic. *Contact the ADM Specialty Chemicals Department.*

ADM Acids Certified Food-Grade

If you use stearic acids or tri-glycerides in making products that must meet Federal Drug Administration regulations, ADM is at your service. ADM has a versatile group of highest quality fatty acids which are certified to pass the Chick Edema factor test as specified by FDA. These food-grade acids are recommended for use in food additives, packaging, and other items that come into contact with foods: mono and di-glycerides, methyl, ethyl and glycerol esters such as sorbitan, sucrose and lactose. They're also useful for preparing fatty acid salts for lubricants used in making foods. *Contact the ADM Industrial Chemicals Department.*

New 2-Component System Gives Higher-Gloss, Chemical-Resistant Coatings

The need: a highly chemical-resistant coating with super-gloss and color retention.

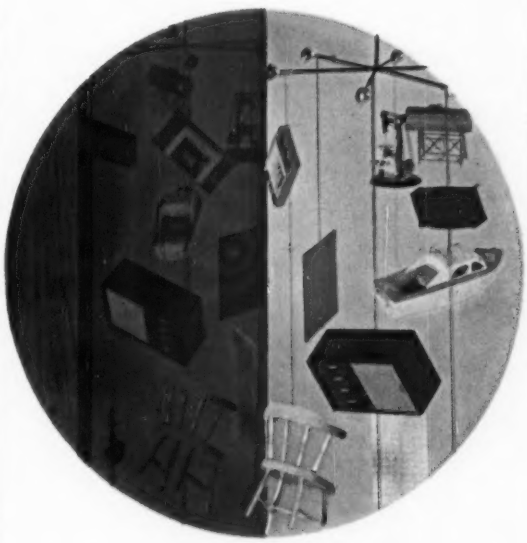
The answer: AROFLINT 505. Coatings made of this new two-component system are so hard and glossy that they can transform inexpensive scored hard board into simulated tile.

Furniture manufacturers who have examined coating made of AROFLINT 505 on walnut-faced plywood say gloss and film are identical to five hand-rubbed coats of nitro-cellulose lacquer.

The outstanding gloss, color retention, chemical resistance, adhesion and versatility of these AROFLINT 505 coatings makes them ideal for unlimited industrial and trade sales applications.

The photograph below focuses on AROFLINT's versatility: wood, metal, fiberglass and scored hard board applications. The deep AROFLINT gloss on the metal front panel in the picture mirrors an array of products which represent just a few suggested uses.

Other AROFLINT features: pot-life of 16-48 hours. Air- or force-dry or bake for excellent cure. Easy application by brush or spray. In a nutshell, AROFLINT 505 combines the outstanding features of epoxy, urethane and polyester finishes with properties these systems lack. *Contact the ADM Resin Department.*



Check the ADM products which you would like to know more about and return to the address below.

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CELOGEN-AZ Foamed Marvinol vinyl-coated fabrics for apparel and upholstery with the feel and look of the most expensive kid leathers are today's most exciting plastic development on the fashion front. Representing beauty as well as value, foamed vinyl, made with CELOGEN® AZ blowing agent, has mushroomed into a $40,000,000 business for the luggage, handbag, apparel, and footwear industries.

Naugatuck Chemical's development of this unique chemical blowing agent is making important things happen; the wedding of CELOGEN-AZ and Marvinol® vinyl, in this instance, has made possible the profitable products listed above.

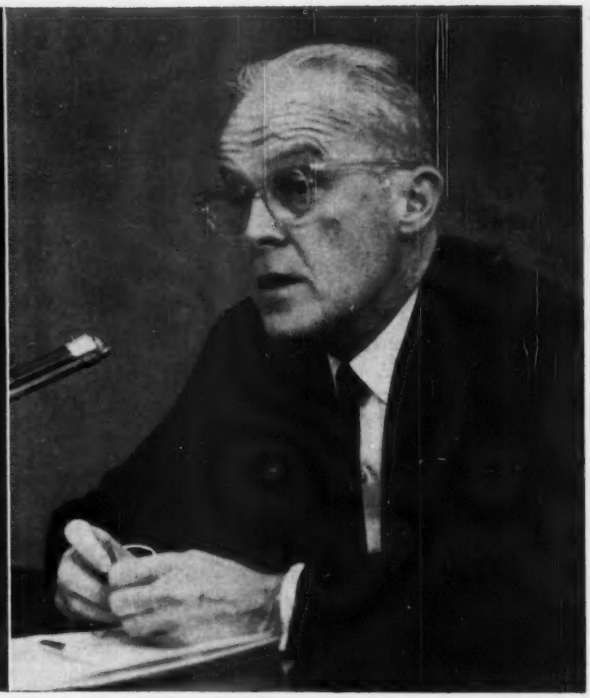
CELOGEN-AZ may also be used with rubber, polyethylene, polypropylene, and ABS products.

Whether it's automotive, high-fashion women's wear or agriculture, Naugatuck Chemical's research makes better products and bigger profits for industry. Why not learn more about these developments by writing to Naugatuck Chemical, Dept. C7, Naugatuck, Connecticut.

NAUGATUCK CHEMICAL DIVISION **United States Rubber**



WARNING: FDA Chief George Larrick says household chemical makers must tell of danger in big, bold type.



REACTION: Paul Butler, representing Du Pont, says FDA is going too far, making a good law unrealistic.

CPI Says No Sale to Lurid Labels

At Food and Drug Administration hearings in Washington last week, the chemical industry spoke out against proposed rules under the new Federal hazardous substances labeling law, due to take effect Aug. 1. FDA officials listened without comment or questions as industry representatives —who supported the law—protested the harshness of the implementing regulations.

Likely outcome: the rules will undergo major changes before becoming final; deadline for compliance will be extended to Feb. 1 (as anticipated before the hearings), but probably not later.

Chemical specialties experts figure that the new rules will require warning labels on about 75% of the industry's products. Cost of meeting the regulation's requirements are hard to estimate; most expensive will be tests to determine if warning labels are needed and—if so—what hazards should be pointed out for each product. The paint industry estimates that the new rules will cost each company from $400,000 to $1 million, depending upon the scope of its line.

Lack of Liaison: "No bill has ever had as much industrywide support as this bill had," said Paul Butler, former national chairman of the Democratic party, representing Du Pont at the hearing. "But after its passage apparently there was no plan for continued liaison with the industry in formulating rules which the industry could live with."

Trade associations—primarily the Chemical Specialties Manufacturers Assn., and the Manufacturing Chemists' Assn.—objected mainly to these points:

(1) Location and size of the warning labels. FDA surprised most industry people by becoming specific about size and location of warning statements. The regulations now demand that the word DANGER, WARNING, or CAUTION, be set in 30-point type (0.42-in. high)—all capital letters. Further, this message—which industry people think will unduly alarm prospective buyers—must appear on the "main" panel of the package, plus one other panel. "If you put all that's required on that panel," said one Du Pont labeling man, "there's not much room left for the brand name. I don't know if it would look like a main panel or not."

(2) Overlabeling could cause consumers to become casual about warnings. Industry people say that because so many familiar products (probably including ordinary household detergents) will carry warning labels, buyers will begin to disregard all such warnings.

(3) Standards of toxicity seem too stringent. The industry had supposed that FDA would regard a product as toxic—and therefore requiring the special label—if it failed the LD-50

FDA heard happy consumers, unhappy industry men

test* at a level of 1 gram, or less, per kilogram of the test animal's weight. But the proposed regulation would declare a substance toxic if a 5-gm. feeding fails the LD-50 test.

(4) Too broad an interpretation on "suitable for household use." Critics charge that the regulations would extend the law to cover products designed primarily for industrial or professional use but which could conceivably be stolen and brought into the home. This is seen by some as an effort to recast the law in line with what the American Medical Assn. wanted—but failed to get—from Congress. AMA wanted legislation to cover hazardous substances everywhere, particularly in business and industry. The law as passed applies only to products used in the home, was pushed through with an emotional appeal about accidental poisonings of children.

Okayed by Consumers: Said FDA Commissioner George Larrick: "It's not surprising some of our proposals are not to the liking of certain industries and segments of industries. It is important to state that we have received many comments endorsing the proposals from consumer groups and from individual consumers who took the trouble to write."

Larrick, who presided at the hearings, didn't question any witnesses. Some industry observers supposed that he feared that any questioning on his part would invite demands for FDA rulemakers to explain the thinking behind some of their handiwork. One theory: FDA underlings were probably overzealous in some cases, and the regulations in question will be modified before enforcement begins; but Larrick would prefer to make the changes quietly.

Indications are that both industry groups and FDA wanted to avoid hearings in the first place. Industry opinions were all well known to FDA; quiet change was hoped for. The only possible effect of the hearings, some industry people believe, will be to give a sounding board to zealous consumer groups that favor the regulations as originally stated. This could make a touchy issue of modification.

* Standard toxicity test—failed if 50% of the test animals die within two weeks after eating prescribed amount of trial substance.

Critical Period: The next few weeks will be the critical stage. Industry spokesmen publicly say that what once looked like a good law may be tied up for some time by litigation arising over the regulations. Their major accusation: that the regulations are not simply interpretive, as they should be, but legislative—going beyond the scope of the law. Privately, many industry lawyers say that litigation will probably prove futile.

It seems likely that an extension of the compliance deadline will be granted, since Dept. of Health, Education and Welfare may, under terms of the law, grant extensions up to Feb. 1, '62. CSMA has proposed an amendment that would grant an extra 12 months' grace. Leaders at first thought FDA supported this, but lately this has been in doubt. FDA is now pushing for implementation of the law on a rush schedule.

Time to Comply: The next question will be how long it takes a maker of household chemicals to comply. Without complications, a label change takes about six weeks, artist to printer. Add to this the delays caused by a wholesale rush to the printer and the period needed to change dealers' inventories, and the time required for compliance grows much longer.

To avoid product-liability problems, most major specialties makers already use warning labels on products that seem to call for them. Many, in fact, felt secure that the new law would require no change in present labeling, are disturbed mainly by the new type size and location requirements.

FDA has indicated that it will not move soon against products that have responsible (albeit not legal to the letter) hazard labels. It will concentrate first on those that have no warnings at all. Thus, it seems reasonable to suppose that the regulations will not spell disaster to the industry. But the present job of making the rules can have far-reaching effects. One small manufacturer points out that his annual profit is about equal to the value of his stock of labels. "If the first set of regulations doesn't work, for us it may be the last," he wryly says.



Interchemical's M. W. Weiss.



Consumers League's Vera Mayer.



Shell's N. H. White.



MCA's Gen. John Hull.

Red Know-How for U.S.

While the U.S. plastics fair (p. 31) was whetting Russian appetites for U.S. know-how, a U.S. businessman wrapped up a deal in Moscow that could lead to a heavy flow of technology from Russia to the U.S.

The pact was signed last week by Jerome Feldman, president of National Patent Development Corp. (New York), and officials of Amtorg, the Soviet trading corporation. The contracts give National exclusive licensing rights for 50-70 Soviet patents—"the cream of Soviet technology," Feldman says. His company will try to sublicense the patents in the U.S., first to its customers, which include Thiokol and International Latex, then to other companies.

National, set up about a year and a half ago, is in the business of procuring and promoting patents.

Feldman has been negotiating for several months with the Russians, who approached his company. He brought with him five technical experts, including a chemist.

While he was still in Moscow last week, Feldman was hesitant about talking in detail about the patents. Reportedly, they include transistors, chemicals, thermoelements, diffusion welding, fine-wire encapsulation, and microwave drawing. National's profit would come from the difference between what it pays and receives for the licenses.

Within a few days after news of the arrangement broke, five companies—including two chemical producers—had called National about procuring licenses on specific Russian processes.

Playing Coy? When Feldman went to Moscow, he hoped to arrange cross-licensing—the Russians taking U.S. licenses in exchange for theirs, with National as middleman. But Feldman found the Russians—in contrast with their usual attitude—relatively disinterested in getting the U.S. licenses. They reportedly took the line that there was no point in talking about it because of the U.S. government policy against giving the Soviets technology. But observers doubt that the Russian disinterest is genuine, speculate that the Russians feel that the sale of technology to U.S. companies would help relax U.S. strategic controls.



John Deere's Hewitt: Standing pat on fertilizer business—for now.

Not Eyeing Expansion

Although Deere & Co. says its nitrogen and mixed fertilizers business "has never been better," the big Moline, Ill., farm equipment company now expects to stand pat on its present hand in fertilizers.

In New York last week to address a group of financial analysts, company President William A. Hewitt told CHEMICAL WEEK that brisk selling has cleaned out the inventories of John Deere Chemical Co. division (Pryor, Okla.) but that management is not thinking of expanding that enterprise.

While the company is "doing well with what we have," he adds, "there's no incentive now to expand into other areas or into other chemical product lines."

The chemical division's sales slipped from $8.3 million in fiscal '59 to $7.7 million in fiscal '60, but it expects a substantial increase this year—particularly in view of its acquisition of Ozark-Mahoning Co.'s (Tulsa, Okla.) mixed fertilizer business earlier this year (*CW, March 11, p. 24*).

Over-all company sales this year are expected to be up by at least 10% from the $468.5 million in the fiscal year ended last Oct. 31; but Hewitt declined to predict earnings. In the first six months of this fiscal year, net income was up more than 100%, to $16.9 million.

For More Aluminum

Aluminum companies are firming up their '61 expansion and financing plans this week (CW, May 13, p. 25):

Harvey Aluminum will build its $35-million, 150,000-tons/year alumina plant "in a commonwealth, territory or possession under the U.S. flag in the Caribbean"; construction will be in two phases: first, a 120,000-tons/year-capacity unit; later, a 30,000-tons/year addition. The firm expects to be granted a mining lease to develop bauxite reserves in Jamaica, in which it would invest $2.5 million. The company also plans to build (location not specified) a rolling mill—capacity: more than 70,000-tons/year; cost: now estimated at $45 million.

Harvey says it has not yet decided whether to double its primary-aluminum capacity by building a new, 75,000-tons/year reduction plant in the Pacific Northwest. It has a contract for electric power for such a plant through '80; this contract will terminate if Harvey fails to give Bonneville Power Administration written notice of the site for that plant by Sept. 30.

Last week Harvey marketed 1 million shares of new Class A common stock at $29.25/share through an underwriting syndicate headed by Kuhn, Loeb & Co. This was expected to net the company about $27.1 million; it might borrow or use other means to raise additional capital needed in its growth program.

Also in the money market last week was Kaiser Aluminum & Chemical Corp. It expected to raise about $9.4 million by sale of 250,000 shares of common stock through a syndicate headed by First Boston Corp. Kaiser is also negotiating (1) the sale of up to $60 million worth of a new series of first-mortgage bonds and (2) a new bank credit agreement for loans up to $90 million. The firm is carrying out a $13-million expansion and modernization program in the U.S. this year, is also negotiating various major ventures overseas.

Other new aluminum projects disclosed last week: Olin Mathieson will invest "several million dollars" in its Omal, O., rolling mill; and Aluminum Ltd. will build an $11-million sheet mill in Kingston, Ont., doubling its rolling capacity in Canada.

Toward Vested Job Rights

Labor unions are carefully building a new body of precedent on transfer and seniority rights. Latest encouragement: an employer's apparent acceptance last week of a federal court decision requiring that the company offer jobs to present employees when it shut down an old plant and opened a new one.

So far, none of the principal test cases in this field has been in the chemical process industries. But since these cases tend to impose new obligations on any employer who shifts production operations from one plant to another, they represent a new labor relations factor of particular significance to CPI and other companies that are often impelled to replace outmoded and inefficient plants.

Union Contract Ending: In the latest lawsuit of this kind, U.S. District Judge Fred W. Kaess ruled that if Gemmer Mfg. Co. closes its Detroit plant Sept. 2, as scheduled, it must offer jobs to its present employees in its new plant at Lebanon, Tenn.—even though its collective bargaining contract with United Auto Workers (AFL-CIO) will expire Oct. 1.

Five employees sued to keep their jobs at the new plant, which UAW says was built for Gemmer to lease, with the understanding that Gemmer would hire only from the Lebanon vicinity. Judge Kaess declared that during the past 20 years these employees had acquired seniority rights that should survive as "earned and vested."

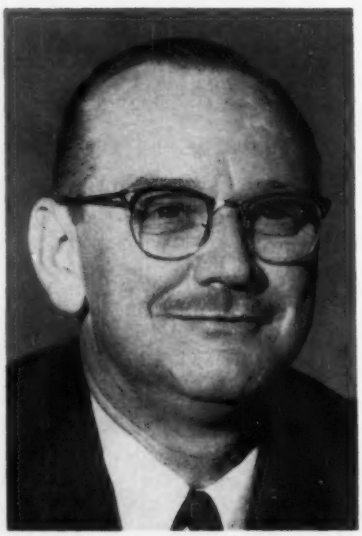
A Gemmer spokesman tells CHEMICAL WEEK that the company has no plans to appeal the decision. Nearly 500 of the 721 Gemmer employees have said they intend to move with the company from Detroit to Tennessee. Another suit is pending in federal court at Detroit to determine whether UAW's Local 80 will continue as bargaining agent for Gemmer workers at the new location in Tennessee.

Following Circuit Court: Judge Kaess based his ruling on a case decided last March in the U.S. Court of Appeals at New York. In that case, the court held that four employees of The Glidden Co.'s Durkee Famous Foods Division were entitled to seniority and re-employment rights in a new plant at Bethlehem, Pa., when the company shut down its plant in New York.

The court noted that Glidden was carrying out its obligations concerning pensions even though its bargaining contract with the Teamsters' union had expired, and maintained that the employees had similarly earned vested employment and seniority rights that "could not be unilaterally annulled." This situation, the court added, would be precisely the same whether the new plant were only a block away or many miles from the old site. In a dissenting opinion, Chief Judge J. Edward Lumbard insisted that "whether such rights continue depends on the terms of the contract" and that in the particular agreement before the court there was no such provision.

In another case, decided in a New York state court last August, Justice Arthur G. Klein ruled that an employer must shut down his new plant in Coffeeville, Miss., and resume his former operations in New York, granting employment and seniority to his former employees at the New York plant.

But that was a special case since the employer was party to an industry-wide bargaining agreement with Amalgamated Clothing Workers (AFL-CIO). Under that agreement, employers are bound not to move their plants or production without the union's consent.



Judge Kaess: In Gemmer case, job rights live after contract dies.

Will the federal government try to take a role in such situations? So far, the only indication of the Kennedy Administration's thinking on these matters has been Secretary of Labor Arthur J. Goldberg's testimony that he favors use of federal funds to help relocate workers from a closed-down plant to a new plant opened by the same company. A bill now before Congress would provide for moving employees—with the aid of federal funds—but only if the employer agrees to hire them.

President Walter Mitchell of International Chemical Workers Union (AFL-CIO) says the UAW-Gemmer decision "possibly points the way to handling worker problems resulting not only from so-called 'run-away plants' but also from automation and other technological change.

"We naturally intend to pursue this legal precedent in comparable situations that our union and its members may face," Mitchell tells *CW*, "but we hope that we can achieve recognition of similar rights through collective bargaining with employers in the chemical industry."

Mitchell commends the example set by Lever Bros. (New York) in '59 when it closed down an old and unneeded plant in Cambridge, Mass. At that time, Mitchell says, Lever agreed to offer to its Cambridge workers any available jobs at its other plants and to help pay their moving expenses. The company says 143 employees took advantage of the offer.

No Cut for Big Users

Electrochemical and electrometallurgical plants in the Tennessee Valley Authority will not be affected by TVA's cuts in electric power rates last week.

TVA estimates the new rate reductions will enable municipal and other local utility systems it supplies to cut their charges 5% to residential and farm users and 8% to small commercial customers.

There is no change in rates on power sold by TVA directly to large industrial users under individual contracts. Average price paid by those users during the fiscal year ended June 30 probably increased by about 3%, to near 4.3 mills/kwh.

More Nitrogen Out West

More nitrogen fertilizer is coming for prairie farmers on both sides of the U.S.-Canadian border.

At Fort Saskatchewan, Alta., Sherritt Gordon Mines (Toronto) is starting to build a 35,000-tons/year urea plant on a do-it-yourself basis. The company declines to say what process it will use, reportedly is still negotiating for licenses. Startup is slated for second-half '62. Construction costs are estimated by outsiders at about $3 million.

And at Lawrence, Kan., Cooperative Farm Chemicals Assn. (CFCA) has awarded a contract to Chemical Construction Corp. (New York) for design, erection and equipping of a 120-tons/day nitric acid unit. CFCA —a subsidiary of Consumers Cooperative (Kansas City, Mo.)—now has capacity for 138,000 tons/year of anhydrous ammonia, 33,000 tons/-year of urea, 110,000 tons/year of ammonium nitrate, and 330 tons/day of nitric acid. The additional nitric unit appears to presage an increase in capacity for fertilizer-grade ammonium nitrate next year.

Sherritt Gordon—which already produces anhydrous ammonia and ammonium sulfate at its chemical and metallurgical works near Edmonton —is now in line to become Canada's third producer of urea (both prilled and crystal forms). Cyanamid of Canada (Toronto) was first, operating a 66,000-tons/year unit at Hamilton, Ont.; and Consolidated Mining & Smelting Co. (Montreal) started up its 33,000-tons/year plant at Calgary, Alta., early in '61.

Output of Sherritt Gordon's urea plant will be marketed by Harrisons & Crosfield (Toronto)—exclusive sales agent for Sherritt Gordon's chemical and fertilizer products—throughout western Canada, the Dakotas and the Pacific Northwest states in the U.S., and overseas.

Ammonia—which Sherritt Gordon uses to leach its nickel-cobalt concentrates—is the basic chemical at the Fort Saskatchewan site; capacity was doubled last year to 66,000 tons/-year, and the company says a modest increase (possibly 10-15 tons/day) is in the works now. Sherritt Gordon also will be producing the carbon dioxide, as well as the ammonia, as raw materials for urea at that site.



Carbide's Humes: From chief of Oak Ridge units to Plastics Co. head.

Up a Plastic Ladder

Union Carbide Plastics Co. has a new president—William B. Humes. R. K. Turner, plastics president since '57, moves up to Union Carbide Corp. vice-president.

During the four years of Turner's presidency, Carbide's old Bakelite Co. division got its new name, increased sales by nearly 30% (to a '59 high of $343 million).

Prior to becoming division president, Turner (59) was general superintendent of Carbide's giant South Charleston, W. Va., works. He received his M.S. in chemical engineering at Massachusetts Institute of Technology, has been with Carbide since his graduation in '24.

Humes (43) joined Carbide in '44, following four years as research director of National Research Corp. (Boston). He received a bachelor's degree in chemistry from Harvard in '40.

Humes' first Carbide job was at Oak Ridge, Tenn., where he eventually became general superintendent of production over all Carbide installations in the area. Later he was made a vice-president of Carbide's Canadian subsidiary, then became president of the Silicones Division. From '57 to '59, he was director of technical planning, then moved to the plastics company as a vice-president.

Projects in the Wind

Oil companies are weighing new petrochemical plans in various parts of the country.

Standard Oil Co. (California), for one, is considering building a refinery and chemical plant in the South, probably at Baton Rouge, La. The project would tie in with the company's recent agreement to buy Standard Oil Co. (Kentucky), which markets gasoline throughout the South. The latter does not have a refinery, buys its gasoline from the Jersey Standard company. The California company says it has "no immediate or definite plans."

Several companies are taking new looks at the Chicago area as possible petrochemical plant sites, wondering if the poor economics they saw there a few years ago might have changed for the better (*CW Business Newsletter, July 15*).

American Oil Co. is formally exploring the area's possibilities, and other companies are watching over its shoulder, while doing some looking themselves. Among them: Sinclair, Cities Service, Standard Oil (Ohio), Ohio Oil Co., and Clark Oil & Refining Co. Most of these firms are primarily interested in producing ethylene and propylene.

About five months ago, Sinclair indicated that it would be interested in ethylene if it saw a 200-million-lbs./-market for itself. Cities Service at that time wasn't interested, regardless of market size.

Now, however, facts uncovered by American Oil—which is pushing ahead its $10-million project—may well have changed the thinking. Ethylene is now available in a limited amount from Union Carbide's Whiting, Ind., plant and by truck from National Distillers' U.S. Industrial Chemicals Division plant at Tuscola, Ill.

Another new petrochemical center is in prospect for Canada. Shell Oil Co. of Canada will build a 31,000-bbls./day refinery at Trafalgar, Ont., between Toronto and Hamilton. It will have cracking and reforming units, produce a wide variety of products, possibly including petrochemicals.

Even if Shell itself doesn't initially produce chemicals there, the new unit will increase the area's refining capacity to 142,000 bbls./day—and that might be enough to entice new petrochemical projects.

national roundup

Rounding out the week's domestic news.

Companies

Atlantic Research Corp. (Alexandria, Va.) is acquiring National Northern Division of American Potash and Chemical Corp. (Los Angeles). National Northern (West Hanover, Mass.) has specialized in research, development and production in high explosives, explosive-metal-forming techniques, and explosive warheads. Atlantic Research plans to combine its U.S. Flare Division (Saugus, Calif.)—which has been working on these same lines—with National Northern under the name U.S. Flare-National Northern Division.

Federal Chemical Co. division of National Distillers and Chemical Corp. (New York) will acquire Farm Fertilizers, Inc. (Omaha, Neb.), through an exchange of stock. Farm Fertilizers—a producer of pelleted and liquid fertilizers—has its main plant at Omaha and branch plants at Fremont, Neb., and Webster City, Ia. The acquisition will give Federal a total of 10 plants serving 12 states.

AIC Chemical Co. division of Amerace Corp. (Butler, N.J.) is changing its name to Allegheny Industrial Chemical Co. The division produces silica hydrogel and magnesium silicates.

Dominion Tar & Chemical Co. (Montreal, Que.) is realigning its operating structure, following its virtually complete acquisitions of St. Lawrence Paper Corp. and Howard Smith Paper Mills (*CW, March 25, p. 42*). Major operating groups: Chemicals, consumer products, newsprint and container-board, kraft and fine paper, packaging and converted products, and Domtar construction materials.

Altamil Corp. (Indianapolis, Ind.) has purchased Archer-Daniels-Midland Co.'s equipment division, whose plant at Neodesha, Kan., manufactures equipment for the animal feed, flour and chemical industries. The unit will operate as the M-E-C Co., division of Altamil.

Expansion

Pulp, Paper: Crown Zellerbach Corp. (San Francisco) will invest $8.2 million to modernize and diversify its pulp and paper mill at Bogalusa, La. The project will include installation of a more versatile paper machine to produce various bleached kraft specialty grades, plus related changes and additions in pulp production and storage units.

Nickel Alloys: Roblin-Seaway Industries (North Tonawanda, N.Y.) is forming a Space Metals Division to produce and sell high-temperature alloys of nickel with chromium, iron, other metals in bars and rods.

Resins, Chemicals: Proctor Chemical Co. (Salisbury, N.C.) has awarded a contract for a $250,000 expansion that will enable the company to produce new products for the textile and chemical industries. The new lines will include anhydroaneaheptitol (AEH) for use in paints and polyesters, and a series of thermosetting resins said to have little or no adverse effect on the lightfastness of reactant dyestuffs.

Photo Chemicals, Films: Anken Chemical & Film Corp. (Newton, N.J.) is increasing its '61 capital expenditures budget to about $1 million. President Louis P. Ratti says it appears that this program can be financed from retained earnings and present working capital.

Flat Glass: International Glass Industries (Bremerton, Wash.) is planning a 20-tons/day flat glass plant at Tacoma. Silica would be obtained from a deposit north of Spokane. Plant cost—estimated at $800,000—will be financed through sale of stock.

foreign roundup

Rounding out the week's international news.

Polypropylene/Austria: Danubia Petrochemie has started operating its 10-million-lbs./year polypropylene plant at Schwechat, near Vienna. The company is a joint subsidiary of Montecatini and Oesterreichische Stickstoffwerke.

Minerals/Israel: The World Bank has agreed to lend Israel's Dead Sea Works Ltd. $25 million toward its $70-million expansion program. An additional $10 million will be raised from other loans, the rest from a share issue, putting the company in majority private ownership for the first time. Among the program's goals: expanding potash output from 150,000 tons/year to nearly 600,000; expanding a subsidiary's bromine plant capacity to 10,000 tons/year (most of which will go into ethylene dibromide production); and building a bromine derivatives plant, to be run by a subsidiary formed with U.S. and British companies. Another subsidiary will run a new, 75,000-tons/year magnesite plant. A salt plant is also being built. Completion is targeted for '65.

Europe's Chemical Groups Close Ranks

There are new signs of increasing cooperation between European chemical industry trade groups.

This is exemplified by favorable response to a suggestion made a few weeks ago by the Policy Committee of the European Free Trade Assn. plastic producers (*chart*). Of the half dozen or more plastic shows scheduled in Europe the next two years, it suggests, EFTA members should concentrate on the three* shows most likely to bolster plastics markets for member nations as a group. Two of the recommended shows are in rival trade bloc—European Economic Community (Common Market)—countries.

Contact between plastics groups, or between chemical industry groups, is nothing new, of course. Industry federations in European countries have existed for many years, and staff level meetings of representatives of European chemical industry associations have been held more or less regularly since '50.

But the creation of the two trade blocs—Common Market and EFTA—accelerated the consultation within each bloc. At the same time, the looming disadvantages of a divided Europe pushed federations in each bloc toward the search for a way to mend the split. And the EFTA Plastics Committee's recommendation in favor of participation in two trade fairs being held in EEC countries illustrates how market considerations can override trade bloc boundaries.

Coming Together: The formation of the Common Market in '57 prompted the first important grouping of chemical trade associations in Europe. In that year associations of Germany, France, Italy, Holland and Belgium set up an organization called SIIC—full name: Secretariat International des Groupements Professionels des Industries Chimiques des Pays de la Communaute Economique Europeenne.

Headquartered in Brussels (where the Common Market's offices are centered), SIIC's mission is to maintain a permanent liaison with various departments of EEC, conduct joint studies of member countries' chemical industry problems, and to develop a common position on these problems.

In addition to the Secretariat, there are working groups on such subjects as tariffs, patents, competition, taxation, transport, statistics, industrial property, and social questions such as labor, workers benefits, etc.

Cooperation in EFTA: Progress toward cooperation between the national trade associations within the EFTA "Outer Seven" group has been slower — partly because EFTA is younger than the EEC "Inner Six," partly because many of its members seem to think of it as a stop-gap measure on the route toward broader European trade integration.

When some of the trade associations did get together within EFTA (to form the Plastics Study Committee), their main concern was not relations with each other, but rather trade with the Common Market and the U.S.

The Policy Committee is composed of three delegates from each of the countries represented — the EFTA member countries and Finland. Finland is associated with the EFTA bloc. The committee had its first meet-

* The committee recommended backing Macroplastics in Utrecht, Netherlands (Oct. 18-25, '62), Interplas in London (June 12-22, '63), and Kunststoffe in Duesseldorf, West Germany (Oct. 19-22, '63).

International European Chemical Organizations

Common Market Countries

Secretariat International des Groupements Professionels des Industries Chimiqu des Pays de la Communaute Economique Europeenne (SIIC)
Headquarters: Brussels

Member associations:
- Verband der Chemischen Industrie (Germany)
- Union des Industries Chimiques (France)
- Associazione Nazionale delle Industria Chimica (Italy)
- Vereniging van de Nederlandse Chemische Industrie (Netherlands)
- Federation des Industries Chimiques de Belgique (Belgium)

Free Trade Association Countries

Policy Committee of EFTA Plastics Associations

Member associations:
- British Plastics Federation (England)
- Fachverband der Chemischen Industrie Oesterreichs (Austria)
- Plastic-Sammenslutningen (Denmark)
- Norsk Plastforening (Norway)
- Gremio Nacional dos Industriais de Composicao e Transformacao de Materias Plasticas (Portugal)
- Svenska Plastforening (Sweden)
- Finska Plastinudstriforeningen (Finland)

EEC and EFTA Countries

Centre Europeen des Federations de l'Industrie Chimique (CEFIC)
Headquarters: Zurich

Member associations:
- The individual member associations of CIIC, plus:
- Association of British Chemical Manufacturers (England
- Sveriges Kemiska Industrikontor (Sweden)
- Foreningen af Kemiske Industrier (Denmark)
- Fachverband der Chemischen Industrie Oesterreichs (Austria)
- Societe Suisse des Industrie Chimiques (Switzerland)
- Norges Kjemiske Industrikontor (Norway)



British Plastics Federation Chairman Radford wants closer ties with Europe.

ing in London last February, and set up a study group to establish rules of origin for the whole industry. Guiding light of the committee and its study group has been the British Plastics Federation, under the leadership of Federation Chairman David Radford and General Manager C.J.D. Stanley.

In theory the committee's study groups are to be composed of experts in the various fields under consideration. In fact, the members of the committee and its first study group are almost identical.

The study group is scheduled to have a second meeting in Copenhagen Sept. 25 to discuss clarification of certain organizational matters, labeling, toxicity of plastics, and to settle upon uniform positions to be presented by the various countries to the General Agreement on Tariffs and Trade (GATT). It will then report back to the Policy Committee, which is charged with defining broad outlines of trade and economic policies for the member associations.

The committee held a second meeting last month in London during the Interplas show there. The show gave EFTA committee members a chance to contact their opposite numbers from EEC, who have been considering similar problems. The EFTA group now plans to meet formally with EEC representatives in Paris in November.

One of the problems besetting this project is that plastic associations in EFTA generally represent the whole range of the industry, from raw-materials producers to fabricators, while EEC plastic federations tend to group only manufacturers of finished products.

But the EFTA plastic associations still believe such a meeting would be fruitful and that organizations from the two blocs could reach agreement on such points as nomenclature, statistics, etc.

Bridging the Gap: Similarly, agreement between European chemical producers has for two years been the objective of the Centre Europeen des Federations de l'Industrie Chimique (CEFIC). This organization, headquartered in Zurich, groups chemical manufacturers' associations from EEC countries minus Luxemburg (the same associations that are in SIIC) and EFTA minus Portugal but including Finland.

About twice a year CEFIC brings together the presidents of the member associations (most of its leading figures have known each other for years). Staff-level meetings are held when necessary, and a permanent secretariat coordinates the paperwork. Meetings are rotated among member countries with the chairman of the host association presiding.

Main objective of these meetings is to air views on the European trade bloc split. Purpose: to work out a system that would protect national industry interests while providing the one goal on which all members agree: "the widest possible market."

Opinions differ widely on the exact form this market would take: for the Swiss it could mean a type of free-trade area; for the French, enlarging the Common Market to include nations such as Britain only if they adhere to the original EEC treaty terms. The problems are complex, and although the federations try to steer clear of pure politics, political considerations inevitably seem to rear up.

So far CEFIC has no specific plan to make approaches to European governments on a union between the blocs, mainly because of the lack of agreement between its members. The one point on which they do agree is that the European chemical industry would benefit from some form of association between the Six and the Seven.

Plastics Tempt Reds

Russians are getting a tantalizing look at the products of the U.S. plastics industry this summer. Scores of equipment and material producers are represented in the mobile U.S. plastics exhibition now touring Russia. Although the 17-week show is strictly noncommercial (arranged under a Soviet-American exchange agreement), it could help generate Russian purchases of U.S. chemical equipment and raw materials.

The exhibit's objective is to illustrate U.S. use of plastics in fields such as aviation, space, sports, the home, electronics and autos. Crowds of Muscovites—who still see only limited use of plastic in their daily lives—gazed at a glass-fiber boat, synthetic fibers and fabrics, squeeze bottles, furniture, a replica of the suit worn by the first U.S. man in space, and such high-strength and high-temperature-resistant items as plastic wind-tunnel blades, a missile radome and jet-craft windshield fairing.

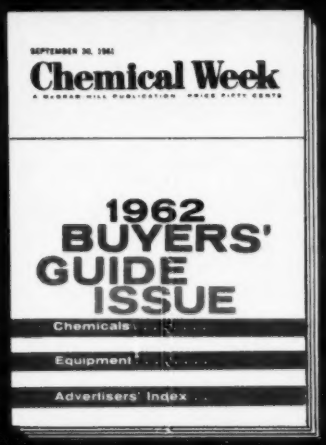
Although the exhibit emphasizes plastic products, working models of fabricating machines are also being shown.

The items—more than 20,000—were donated by the U.S. firms, which cooperated with the State Dept. in arranging the exhibition through an eight-man committee of the Society of the Plastics Industry.

Sales Ahead? Traveling with the show as technical advisors are George Lubin of Grumman Aircraft Corp. (Bethpage, N.Y.) and Armand Winfield of DeBell & Richardson (Hazardville, Conn.) a plastics consultant company.

Winfield says the U.S. companies made their contributions to the show as a service to the country and in the hope of a publicity feedback to the U.S., rather than with the aim of obtaining new customers. Nevertheless he is optimistic that some sales will stem from the exhibition—he has already been approached by Soviet officials interested in buying plastic raw materials, equipment and technology. There has been particular interest in reinforced glass fiber and in Teflon and Delrin.

Although Winfield is not empowered to negotiate for U.S. companies at the fair, he will refer Russian inquiries to the U.S. firms concerned.



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Washington
Newsletter

CHEMICAL WEEK
July 22, 1961

A bill to impose stricter controls on drug manufacturers is being prepared by the Kennedy Administration. Under present plans, it would be only slightly less stringent than a similar measure already introduced by Sen. Estes Kefauver (D., Tenn.). The chief difference is that the Administration probably will not go along with Kefauver's proposal to require licensing of drug manufacturers.

Otherwise, the Administration bill would call for: proof of efficacy before a new drug is licensed for market; certification of antibiotics; factory inspection; new and strict standards for safety control; premarketing clearance of cosmetics and therapeutic devices; tighter controls over distribution of barbiturates; and more detailed reports of any adverse reactions suffered by patients. Separate legislation may be proposed to cover supervision of advertising and promotion and to require the general licensing of patents.

The Administration hopes to present the bill to Congress before the end of the current session, but the big push for enactment is not scheduled before next year. Long before then, it must make its peace with Kefauver, who considers this his special bailiwick. The Administration bill would go to the Commerce Committee in the House and the Labor and Public Welfare Committee in the Senate—bypassing Kefauver's Antitrust Subcommittee that has held so many hearings on the subject.

•

The Veterans Administration will buy all ethical drugs needed by all civilian agencies of the federal government starting Nov. 15. The man in charge of what will amount to a $40-million/year business will be James M. O'Neil, director of VA's supply management services. The new "single-manager" system was worked out by VA, which normally buys $25 million worth of drugs each year for its own installations, and the General Services Administration, which has been buying $15 million worth annually for other civilian agencies.

The basic idea is to give civilian agencies of the government a price advantage—through mass purchases—equal to that achieved by the military services. The Navy's military medical supply agency now buys drugs for all branches of the armed services. O'Neil believes savings from volume buying and the stocking of drugs by generic names could drop prices as much as 35% below those the drug companies offer other institutional buyers.

Of the $25 million worth of drugs bought annually by VA, about $10 million worth is purchased by generic name. VA hopes the same proportion can be bought generically for other agencies. But VA does not, and will not, require use of generically named drugs. Much the same is true of overseas purchases. Last year, VA bought $800,000 worth of drugs abroad. But O'Neil says "we don't want to buy abroad. We just want to see the U.S. firms meet the price."

Washington Newsletter

(Continued)

Water- and air-pollution problems will be upgraded by the Kennedy Administration but will not be pulled out from under the Public Health Service. Some Democrats in Congress have objected to "control by doctors" and want to treat pollution more as a resources and engineering problem. Secretary of Health, Education & Welfare Abraham A. Ribicoff doesn't quite agree. He plans to keep control under the Surgeon General but will give pollution experts a more direct line to his office. What Ribicoff has in mind is a new Bureau of Environmental Health, with divisions to handle water pollution, air pollution and radiological health.

Expanded federal control over water-pollution problems has been approved by Congress. A bill sponsored by Rep. John A. Blatnik (D., Minn.) was high on Kennedy's priority list. In addition to providing new money, it will permit federal officials to enforce antipollution measures on intrastate bodies of water if the governor of the state involved requests such action. Under the old law, federal authority was restricted largely to interstate waters.

Here is the new money available in federal grants to communities for sewage disposal plants: $80 million in the current fiscal year, $90 million in fiscal '63 and $100 million in each of the next four fiscal years. The measure also increases from $250,000 to $600,000 the amount an individual community may get for a single project. If communities band together, they may get as much as $2.4 million.

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Civil antitrust suits against four major rock salt firms have been filed by the government. This is a follow-up of last month's criminal indictment of the companies on charges of conspiring to fix prices on rock salt (*CW Washington Newsletter, July 8*). The civil suits seek to restore competition and prevent further antitrust violations. Involved are Morton Salt, International Salt, Diamond Crystal Salt and Carey Salt Co.

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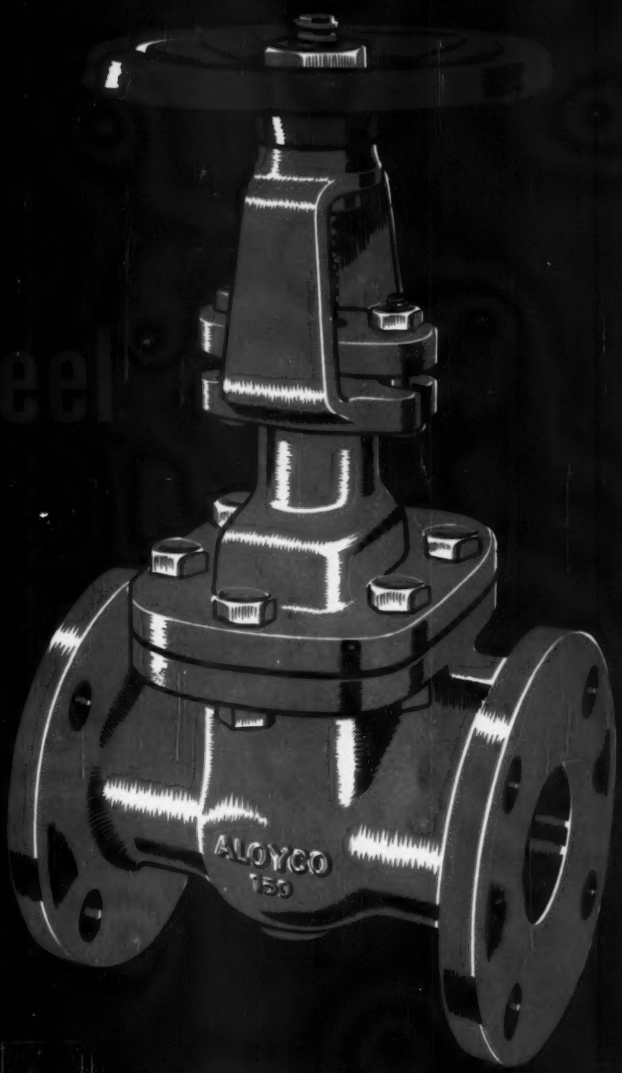
Another push to enact "fair trade" legislation has begun in the Senate—despite all-but-certain opposition from the Kennedy Administration. Sen. Hubert H. Humphrey (D., Minn.), chief sponsor of what is now called the "Fair Competitive Practices Act," is trying to soften expected opposition from the Justice Dept. and the Federal Trade Commission. But his chances of success are slim.

Proponents of the bill—including druggists, gasoline dealers and merchandisers of photographic equipment, clothing, sporting goods and books—will testify before a Senate Commerce Subcommittee July 25 and 27. Opponents will be heard later. There is still relatively slight chance of enactment in the current political climate.

•

Intensified efforts to eliminate repackaging of drug samples intended for phyicians are called for by Food & Drug Administration Commissioner George Larrick. He notes 15 seizures of physicians' drug samples in the past two weeks. Abuses can be stamped out, he says, with the cooperation of the pharmaceutical industry, the medical profession and druggists.

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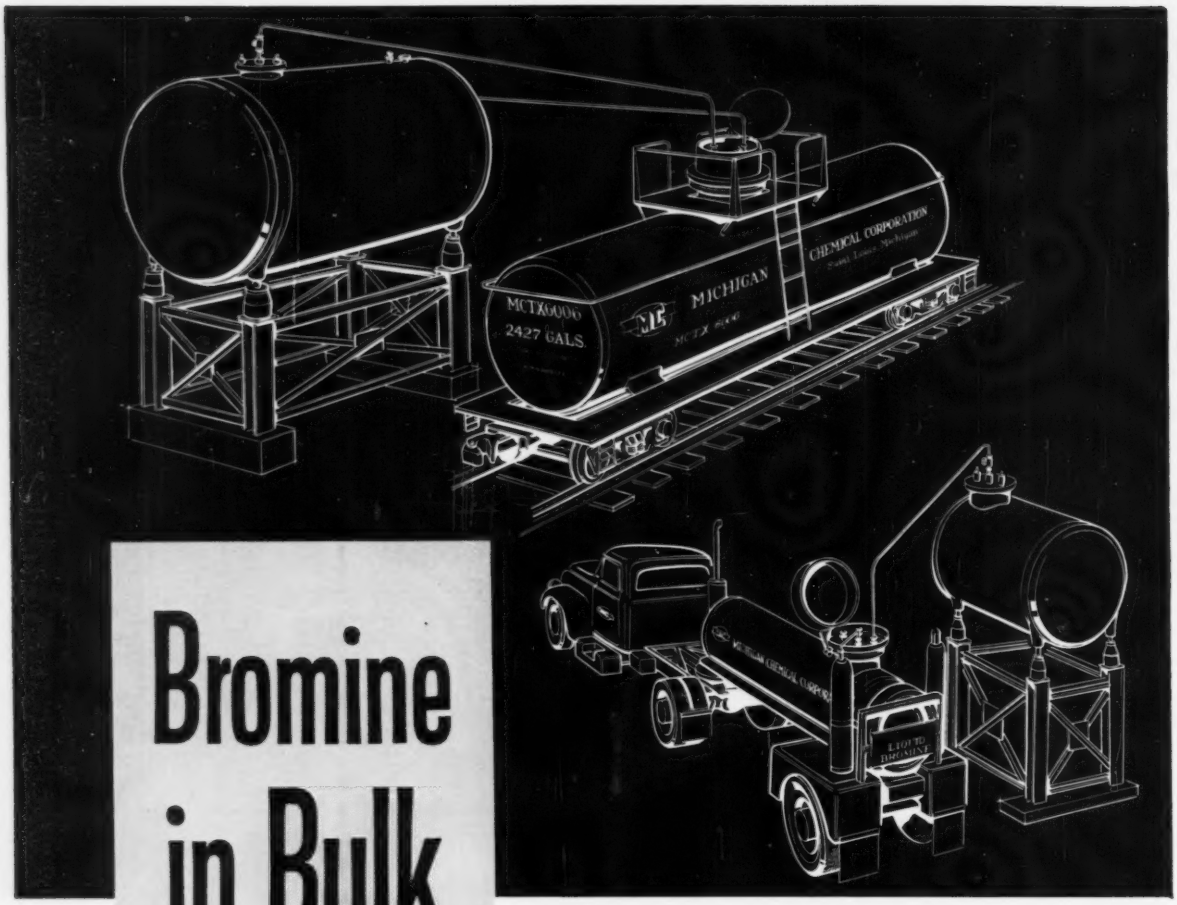
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New Payoff in Peroxide Research

New organic diperoxides are leaving the research labs, enabling the development of cross-linked, thermosetting polyethylene, vinyls and ethylene-propylene rubber.

Organic peroxide research is yielding new products—Wallace & Tiernan's Lucidol Division (Buffalo, N.Y.) is commercializing some new diperoxides, and U.S. Peroxygen Corp. (Richmond, Calif.) has test lots of new diperoxides available. The debut of these new materials boldly underscores growing commercial opportunities for peroxides in production of polymers—e.g., cross-linked thermosetting polyolefins, olefin rubbers and new vinyl products. If the work pans out as expected, peroxide demand will slight its current $15-million/year pace.

Lucidol's entries: Lupersol 101, Luperox 118 and Luperco 130-XL. These compounds are respectively 2,5-dimethyl-2,5 - di(tert-butylperoxy) hexane; 2,5-dimethylhexane-2,5-di-(peroxybenzoate); and 2,5-dimethyl-2,5-(tert-butylperoxy)hexyne-3. The 101 compound is now also sold by the R. T. Vanderbilt Co. (New York), under the name of Varox.

U.S. Peroxygen is making available pilot quantities of a product called USP 711—the same compound as Luperox 118—and its corresponding diperacetate, USP 811 (*CW, June 10, p. 58*). These have properties similar to tert-butyl perbenzoate and tert-butyl peracetate.

Patent Hurdles: New product development has been so fast-paced that a patent bottleneck in peroxides is shaping up. Lucidol, which does about 50% of the business, expects soon to receive a number of new patents in this field. Lucidol believes these could trip up producers eager to break into the field.

Already, a hassle may be forming over the patent owned by Nicholas Milas (now at Massachusetts Institute of Technology) for the manufacture of di-tert-butyl peroxide. Lucidol and Shell Chemical have licenses under the patent, but the trade is rife with reports that a nonlicensee (one guess —U.S. Peroxygen) will market the compound. Lucidol, according to Richard Berry, its manager of commercial chemical development, is prepared to take legal action if a newcomer materializes.

Lucidol is also flexing its muscles

Cadet Chemical Corp. Burt, N.Y.	Manufactures only, sells through McKesson & Robbins (New York). Products include benzoyl peroxides, lauroyl, cyclohexanone, MEK peroxides and tert-butyl hydroperoxide. Company carries on product-improvement research.
Hercules Powder Co. Wilmington, Del.	Producer of dicumyl peroxide, cumene hydroperoxide and diisopropylbenzene hydroperoxide. Holds basic patents in this and other areas. Working on emulsion polymerization and polyethylene applications.
Heyden Newport New York	HN's Nuodex Division sells Lucidol (see below) products such as benzoyl peroxide, lauroyl, MEK peroxides and p-menthane hydroperoxide. Newport Industries Co. is doing research on terpene-derived peroxides.
Lucidol Division Wallace & Tiernan Inc. Buffalo, N. Y.	Makes over 25 organic peroxides; claims much of the business. Research covers all aspects of the field. Main areas: in cross-linked polyethylene, vinyl monomers and in ethylene-propylene rubber.
Norac Chemical, Inc. Azusa, Calif.	Makes MEK peroxides and benzoyl peroxides. Sells Norax tradenamed products.
R. T. Vanderbilt Co. New York	Makes Varox (basically same as Lucidol's Lupersol 101). Research concentration is on cross-linking polyethylene.
Reichhold Chemicals, Inc. White Plains, N.Y.	Sells benzoyl peroxide pastes and MEK peroxides. Research keyed to items that find use in polyesters.
Shell Chemical Co. New York	With Lucidol, it has license from N. Milas for the di-tert-butyl peroxide; some research being done here.
Thompson Chemical Co. Pawtucket, R.I.	Began selling lauroyl peroxide in late '60, is doing some work in acrylates and polyolefins.
U.S. Peroxygen Corp. Richmond, Calif.	Makes benzoyl peroxides, cyclohexanone, MEK peroxides. Also claims considerable business in custom-made specialty peroxides, particularly for use in making new polyolefins.

in anticipation of receiving wide-ranging patents.

The patent situation, however, isn't too clear now, partly because some diperoxides are not distinct chemicals. They are complex mixtures of chemicals, and, like all the peroxides, dangerous to handle and hard to manufacture.

Time to Collect: It's clear that Lucidol is determined to keep its eminence in the field, now that the use of organic peroxides for cross-linked polyethylene, catalysis of vinyl polymers, and ethylene-propylene rubber (*CW, June 10, p. 51*) is about to enter a big new phase.

The rubber, for example, is as little as a year away from large-scale manufacture — by Montecatini in Italy. When it comes, with its low cost and valuable properties, it's likely to find ready acceptance. All the major U.S. propylene producers (*CW, June 24, p. 48*) are investigating it—any one could introduce such an elastomer. Lucidol is primarily aiming its 130-XL at this application (although the peroxide has other uses).

Polyethylene catalysis with peroxides is, of course, already here in full commercial fashion. Today it's the biggest single market for peroxides, and it seems due to grow significantly. Both Luperco 101-XL (the solid form of Lupersol 101) and Luperco 130-XL are now used in pilot runs for cross-linking polyethylene and ethylene copolymers.

Since these peroxides do not act except at relatively high temperatures, they can be blended with melted polyethylene and then cured at a higher temperature after extrusion or other forming.



Lucidol's Berry: He claims the patents that insure exclusive peroxides.

The result is a cross-linked polyethylene, which is a thermoset polymer, not the usual thermoplastic polyethylene. The polymer molecule chains are hooked to one another, forming a molecule as resistant to deformation as a cross-braced cage. Such molecules have high solvent resistance, relatively high resistance to thermal distortion and to environmental stress-cracking, plus a notable lack of creep.

Almost all the polyolefin producers are looking at peroxides in this application. And many firms are edging into peroxides manufacture for this use. This includes Cadet Chemical Corp. (Burt, N.Y.), Hercules Powder Co. (Wilmington, Del.), R. T. Vanderbilt Co. (New York), Reichhold Chemicals, Inc. (White Plains, N.Y.), and Shell Chemical.

Two Cracks at Vinyls: In the polymerization of vinyl monomers, the diperoxides have the unique property of initiating chain growth from both ends of the molecule.

Product of this growth is a new polymer of high average molecular weight and broad molecular weight distribution. This makes extrusion easier and cheaper because of the wide temperature range over which softening takes place.

Each diperoxide breaks down at a fairly distinct temperature, depending on the compound. Because of this, a variety of diperoxides are required to cover a broad range of temperature levels.

The Products: Lucidol developed its three new diperoxides to meet this need for varying thermal characteristics. Thus Lupersol 101 is applicable to styrene polymerization (90-125 C); the 118 works in a low range (from 80-100 C); and the 130 diperoxide is effective at temperatures too high for most current commercial applications. It is expected that uses for the latter will develop with the growth of higher-temperature technology.

The diperacetate analog of low-range Lupersol 101 (which U.S. Peroxygen now makes) has been tried, although it has been found to be a shock-sensitive compound. Work continues, however, on other compounds that are effective at low temperatures. Polyvinyl chloride requires such an initiator—one working at about 40 C. A diperoxide for this job could yield a higher-molecular-weight PVC than is now possible and one with a broader molecular-weight range.



U.S. Peroxygen's Buschman: He leads a small but scrappy competitor.

Polyethylene Favorite: Dicumyl peroxide, made by Hercules Powder Co., is the peroxide now used in the commercial cross-linking of polyethylene. The peroxide is attractive because of its low cost and availability. Its disadvantage, which hinders application in molded products and piping, is that it may produce undesirable odor—acetophenone is generated on decomposition. Also, scorching (premature cross-linking) can make it difficult to get top-quality products in certain formulations.

The Cabot Corp. (Boston) has been doing extensive research that may well yield a strong market for peroxides. This firm has been mixing the peroxide cross-linking agent with carbon black. It is developing a new plastic pipe, presumably of this combination. The pipe manufacture involves a dielectric heating process, which could cut the curing time for cross-linked polyethylene (at 320-350 F) from one hour to two seconds.

Cabot's initial commercialization is in the field of wire insulation. The firm declares that carbon black and

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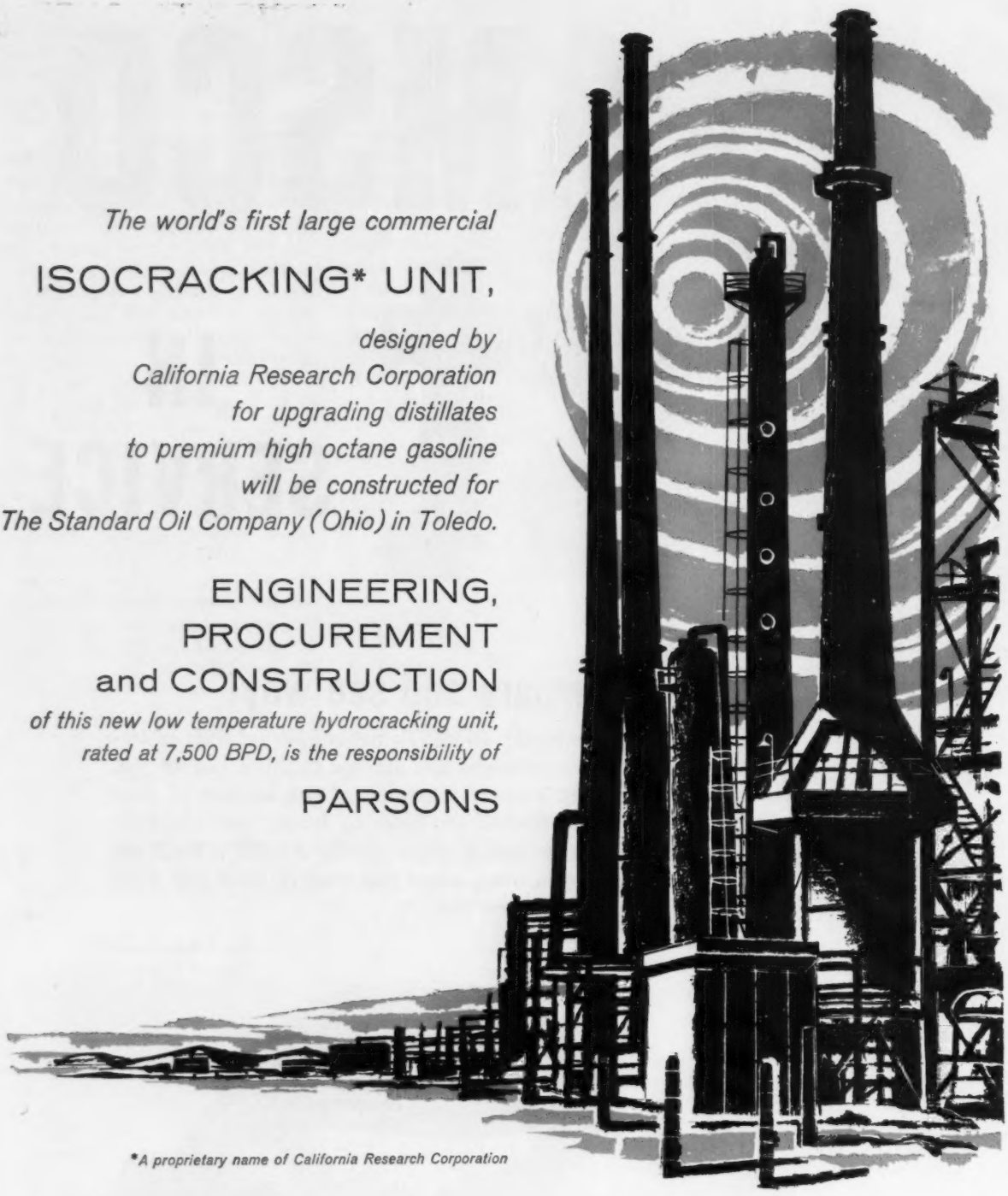
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Lucidol's 101 peroxide help yield a cross-linked polyethylene that has better impact strength and scorch resistance (due to higher processing temperatures) than other cross-linked polyethylenes now marketed. It is also said to be odorless.

In addition, polyethylene containing carbon black has been found to be an excellent insulator. Even with as much as 50% carbon black, it is still a good insulator. But enough carbon black can be added to render the plastic conductive.

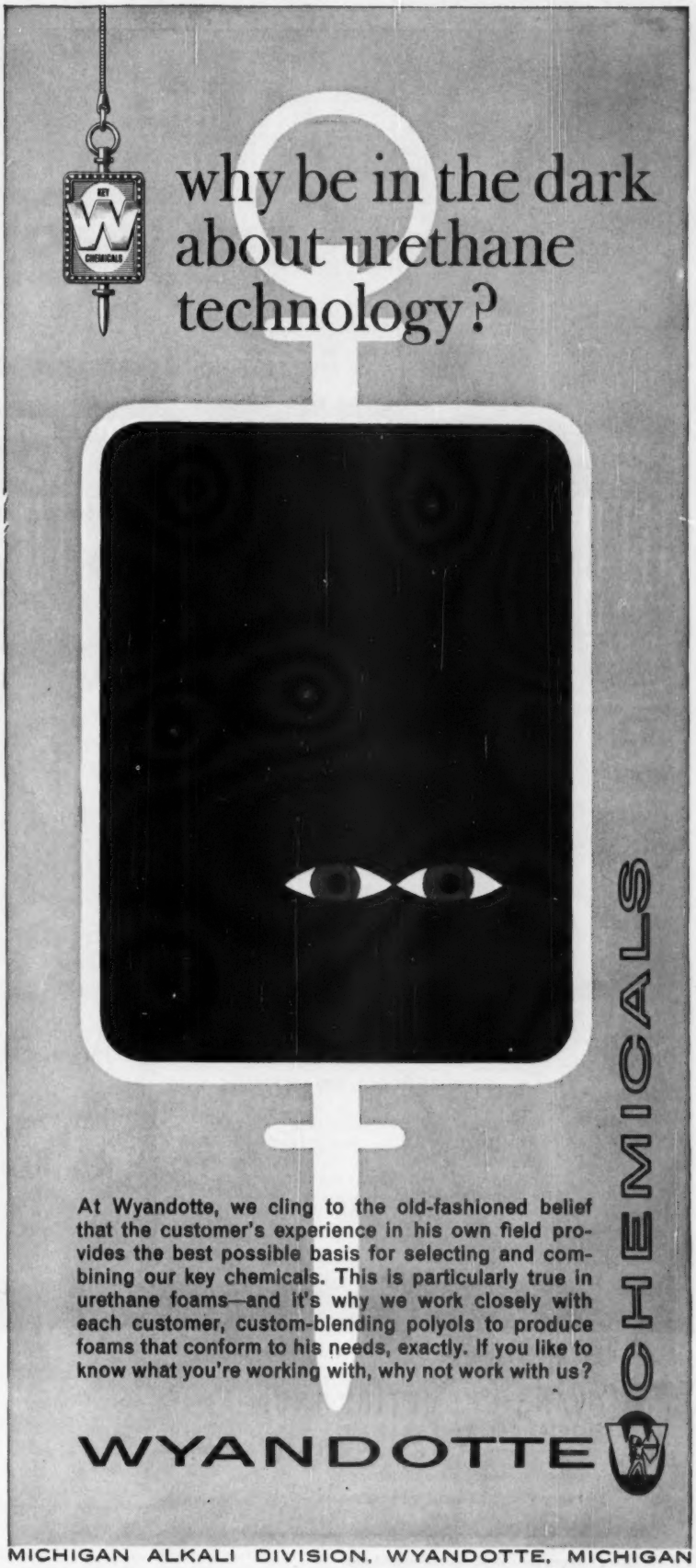
Peroxides are also used to accelerate the polymerization rate. As an example, in the controlled polymerization of polyester-styrene varnishes, peroxides and other free-radical initiators such as azo compounds can be expected to be effective catalysts. The peroxides and azos can be used in the presence of activators and promoters.

Curing conditions dictate specific peroxide choice. Since molding compounds are polymerized at high temperatures over a relatively long time, they may require alkyl peresters, such as tert-butyl perbenzoate. For high-temperature cure, benzoyl peroxide is frequently used, since it does not decompose before the resin has attained its optimum curing temperature.

MEK Peroxide: U.S. Peroxygen Corp. says that, thanks to new manufacturing processes, it has been able to improve the characteristics of its methyl ethyl ketone peroxide (labeled Hi Point 180 MEK peroxide). The resistance to metallic contamination has been reportedly increased, and there is now said to be no possibility of water-phase separation.

David Buschman, president of USP, illustrates his product's resistance to metallic contamination by showing a bottle of his MEK peroxide in which iron nails have been immersed for four months. The nails have not rusted and the peroxide shows little loss of active oxygen. Buschman points out that this resistance to metallic contamination in no way impairs the peroxide's reactivity with common metallic promoters such as cobalt naphthenate and similar materials.

Lucidol has made an addition to its line of MEK peroxides. Called Lupersol Delta-X, the new peroxide is said to cure faster than the other two





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MEK peroxides now sold by Lucidol.

Use Breakdown: The amount of catalyst used depends on the type of resin, the speed of cure and the size of the cured piece. The range is 0.1-2% peroxide with the low amount being for heavy castings and the high for thin laminates.

The organic peroxides now find primary application as plastics catalysts; to a small degree, they're used in the bleaching of flour. In the plastics field, polyethylene fabrication is the big customer—almost one-third of the catalyst business is done here. Next biggest outlet: production of polyvinyl chloride and its copolymers; then comes catalyzation of polyesters, polystyrene, the polyacrylates and miscellaneous plastics (mainly alkyds and silicones).

The use in polyesters has been growing, although the slump last year in luxury items—e.g., plastic boats—put a dip in the sales curve. The PVC and copolymer markets have held up well. Styrene can be polymerized by a peroxide or by thermal methods; the bulk has been done with peroxides.

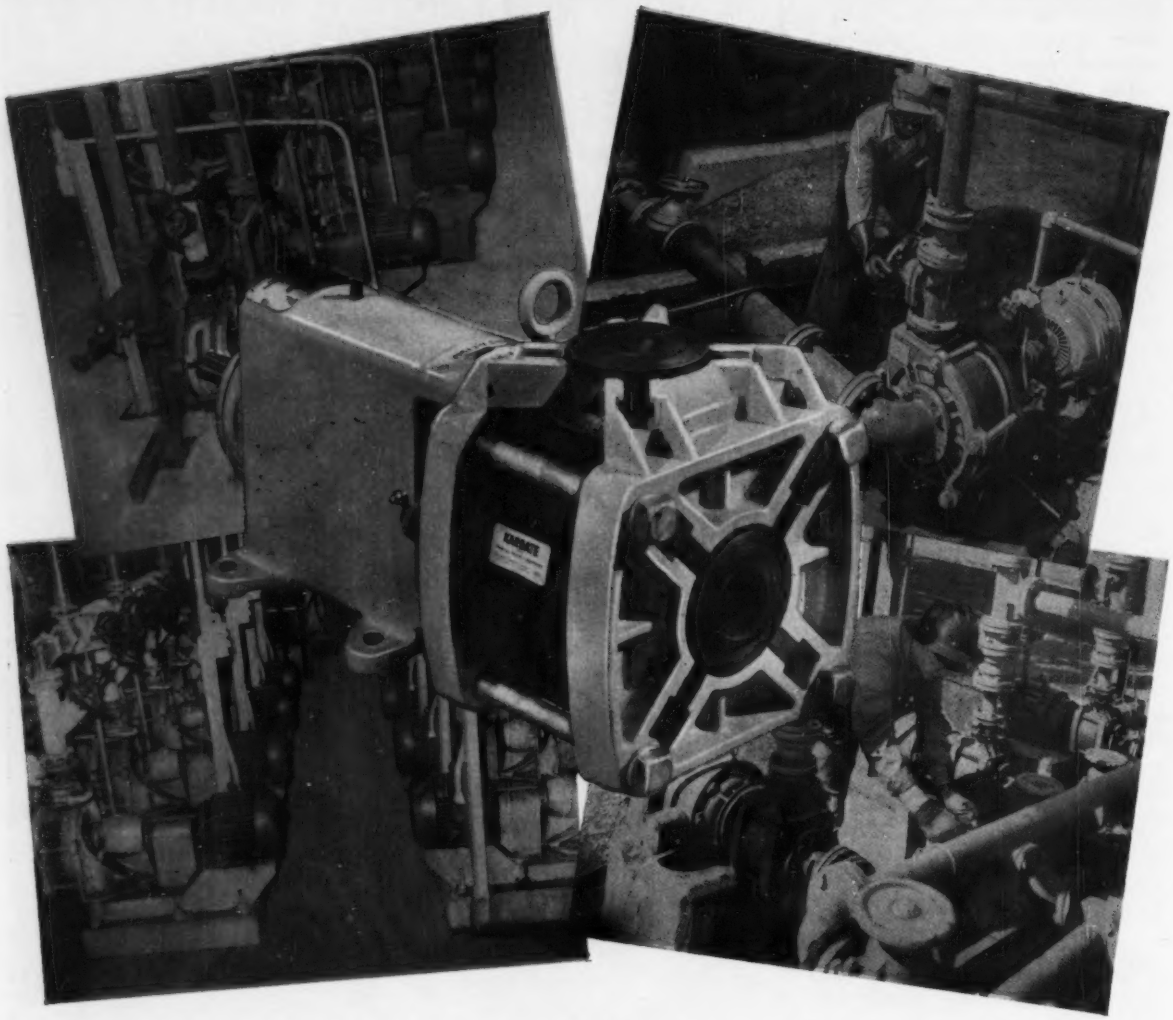
The over-all direction of research in organic peroxides is toward those that will operate effectively over a wide scale of temperatures. The market potential is strong and the field should be active for some time.

EXPANSION

- Materiadyne Corp. (Rochester, N.Y.) is a new firm, headed by George Atwater, devoted to basic research in metals and high temperatures.
- J. M. Huber Corp.'s Chemicals Division will complete a new laboratory and administration building at Havre de Grace, Md., in September. Other research, technical service and product evaluation laboratories will be built on the five-acre site.
- Reichhold Chemicals, Inc., will build a 20,000-sq.ft. research and development laboratory at its Tacoma, Wash., plant. Upon completion of the building in November, about 65 employees will be transferred from Seattle to Tacoma and the Seattle operation will be terminated.
- Cryogenics, Inc. (Stafford, Va.), is offering a commercial calibration and testing service for devices used in low-temperature applications.
- Aerojet - General Corp. has formed a new subsidiary—Space-Gen-



NEW FRAME-MOUNTED MODELS EXPAND "KARBATE" PUMP LINE!



National Carbon's addition of "Karbate" frame-mounted Type F pumps to its line provides today's widest selection of impervious graphite centrifugal pumps!

Designed and built by the world's leading producer of non-metallic centrifugal pumps, the new Type F has 1, 1½, and 2-inch discharge openings, and features the same wet end parts and mechanical seal used on proved motor-mounted models.

With capacities to 140 gpm and heads to 67 feet, the new frame-mounted Type F brings to 32 the number of standard sizes of "Karbate" impervious graphite pumps . . . offering discharge openings ranging from 1 to 4 inches, capacities from 5 to 1500 gpm, and heads from 15 to 120 feet.

You can depend on the unsurpassed corrosion resistance of "Karbate" impervious graphite centrifugal pumps for all corrosive pumping service. For details on models and sizes, write: National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada:* Union Carbide Canada Limited, Toronto.

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NATIONAL CARBON COMPANY

UNION CARBIDE

eral Corp.—for design and development of complete missile and space systems. Combining the staffs of Aerojet's Spacecraft Division and Space Electronics Corp., the new firm will occupy a plant to be built in the Los Angeles area.

• Personnel and projects now at Monsanto's Dayton, O., laboratories will be moved to the company's new research center later this year. The Dayton facilities will be taken over by Monsanto Research Corp., a wholly owned subsidiary that handles Monsanto's government contract work.

• A new, $600,000 research and development center has been opened at Wharton, N.J., by Lock Joint Pipe Co., concrete pipe maker.

• A 90-acre research park, to be known as McLure Park, is being developed north of West Lafayette, Ind., by Purdue Research Foundation.

CONTRACTS

• A $100,000 contract to establish industrial research in the Philippines was awarded to Armour Research Foundation of the Illinois Institute of Technology (Chicago). Sponsored by the International Cooperation Administration (Washington, D.C.), the contract calls for ARF to furnish technical advice, guidance and training to the Philippine National Institute of Science and Technology. Particular emphasis is being placed on agricultural raw materials and waste products research. Similar programs have been conducted in Burma, Mexico, Colombia, Argentina, Venezuela and India; and such a program is now under way in Afghanistan.

• Ionics, Inc. (Cambridge, Mass.) has received a $49,381 contract from the Air Force for development of a lightweight fuel cell for space use.

• General Dynamics/Convair (San Diego, Calif.) will study design concepts for "meteoroid bumpers"—materials to protect space vehicles from damage by collision with meteoroids, the tiny particles found in many areas of space that travel at 30,000-300,000 ft./second. Initial tests will be at velocities up to 20,000 ft./second and will be carried out on copper, aluminum alloys, magnesium alloys, titanium, and laminated and composite structures.



cyanamid sulfosuccinate

Aerosol® surfactants	Molecular weight	Melting point of solid, °C	Solubility @ 30°C		Surface tension (dynes/cm) @ 25°C using 0.1% sulfosuccinate	
			Water, g/100ml	Mineral oil	In water	In electrolyte solution
Aerosol TR (tridecyl ester)	584	120-130	0.5	Very soluble	29.6	—
Aerosol OT (2-ethyl hexyl ester)	444	153-157	1.5	Soluble	28.7	24.6 (in 1% Na_2SO_4)
Aerosol MA (hexyl ester)	388	199-202	34.3	Slowly soluble	45.8	24.7 (in 5% Na_2SO_4)
Aerosol AY (amyl ester)	360	222-227	39.2	Insoluble	50.2	24.8 (in 15% Na_2SO_4)

The varying characteristics of Cyanamid's sulfosuccinates make it possible to select a surfactant with properties closest to your specific needs. The table above shows, for instance, that surface tension in electrolyte solutions can be reduced to a minimum with the choice of the appropriate surfactant.

In emulsion polymerization, too, versatility is evident. Using styrene as the monomer, the data shows that a range in particle size and viscosity is obtainable, depending solely on which sulfosuccinate is employed

CYANAMID

surface active agents

Salt tolerance: Amount of sodium chloride tolerated by 0.05% sulfosuccinate	Optimum wetting action	Critical micelle concentration, g/100ml @ 25°C	Polystyrene Latex emulsion properties, using 2-3% sulfosuccinate on weight of monomer: Particle size, microns	viscosity, seconds (Ford cup #4)
0-0.05%	At high temperatures (60-100°C)	0.001	.23-.31	15.7
1-2%	At ordinary temperatures (20-60°C)	0.07	.065-.085	12.4
12%	In saline solutions (3-10%)	1.0	.24-.26	11.7
20%	In concentrated saline solutions (> 10%)	1.2	.36-.44	10.0

as the emulsifier for that system.

The sulfosuccinates are only one family of surface active agents produced by Cyanamid. For your copy of our comprehensive booklet, "Aerosol Surface Active Agents," please write us on your business letterhead.

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GLYCOLS for POLYESTER RESINS



Photograph: Courtesy of Whitehouse Plastics, Ft. Worth, Texas.

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Propylene glycol is the lowest cost commercially available glycol for polyester resins. This, together with the outstanding resin properties it imparts, is the reason for its rapid growth as a component of these materials.

Polyesters prepared from propylene glycol have excellent strength properties and water resistance, are light-colored, stable, and dissolve easily in styrene. They provide fast wet-out for hand lay-up, contact-pressure mouldings. Outstanding physical properties are obtained on laminates prepared with matched metal dies at moderate pressures.

The use of propylene glycol as the basic glycol component of polyesters gives the resin producer considerable formulation latitude. For example, the addition of ethylene glycol increases strength and hardness while the incorporation of diethylene or dipropylene glycols results in a softer, more flexible polymer. By varying the type and quantity of other glycols added to propylene glycol, polyesters may be tailor-made for a particular end use. Whether your application is for boats or buttons, chances are the use of propylene glycol-based polyesters will lead to improved products and profits.

GLYCOL PRICE SCHEDULE

Propylene Glycol	12½ cents/pound
Dipropylene Glycol	14¼ cents/pound
Ethylene Glycol	13½ cents/pound
Diethylene Glycol	15¼ cents/pound

Current prices for tank car quantity (4,000 gal. min.) F.O.B. shipping point, freight allowed in the East. Subject to change without notice.

For complete information on Jefferson Propylene and Ethylene Glycols, please contact Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

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037

Stainless in Price Pinch?

A 7¼¢/lb. nickel increase may boost stainless-steel prices, spur other metals' use in equipment.

Stainless-steel producers this week are still in a turmoil over the sudden 7¼¢/lb. nickel price increase posted by The International Nickel Co. of Canada, Ltd., on June 30.

And as the producers weigh the pros and cons of price increases that are inevitable in some stainless-steel grades, the chemical process industries have cause to ponder potential equipment price increases and possible switches in specialty metal purchasing.

CPI firms, which have a reputation as reluctant buyers of stainless (it is often cheaper to buy a piece of carbon steel pipe at 10% of the cost of stainless and replace it every few years), still purchase over 140 million lbs./year for process use, compared with 40 million lbs./year 10 years ago.

A rise in stainless-steel prices could improve the competitive positions of most other specialty metals producers. The latter, who often have had a difficult time selling against stainless, can be counted on to quickly point out that stainless no longer enjoys a wide cost edge. And it will give aluminum producers a new opportunity to promote their lower-cost-than-stainless products.

For example, a heat exchanger with an aluminum tube bundle of 1,000 tubes, 16 ft. long with ¾-in. outside diameter and 0.065-in. wall thickness is one-tenth as costly as a Type 304 stainless-steel exchanger. It would even be cheaper than a mild-steel exchanger—only about one-third the cost, according to Stanley Beeler, Reynolds Metals' CPI marketing manager.

And whereas stainless-steel prices seem destined to continue to rise, titanium's continue to drop. Although no official titanium price schedule has been issued for over a year, Titanium Metals Corp. of America reports many plate and sheet prices down 10-20% since Feb. '60. This is reflected in equipment prices—e.g., a titanium heat exchanger will cost less than twice that of a Type 316 stainless-steel exchanger, according to Lawrence Rodgers, Pfaudler's product manager of special metals. A titanium exchanger would have cost over twice that of a stainless exchanger a year ago, almost three times as much two years ago (*CW, May 21, '60, p. 61*).

Little Change: However, there are indications that the increase in nickel prices will do little to change the cost position of stainless-steel equipment in relation to equipment of other metals. Although price schedules haven't been made available, Crucible Steel Co. of America increased the base price of all nickel-bearing stainless steels two weeks ago by an average of about 2%. Other stainless producers will probably come up with schedules showing selective price increases—larger for the high-nickel-content grades, smaller for the lower-content grades. The price situation is somewhat muddled because of price shaving, particularly at the warehouse level. And, within recent months, stainless had actually come down in price—until hit by the nickel price increase.

However, one equipment fabricator points out that even a 5% increase in the price of stainless steel probably wouldn't add more than 1% to the finished equipment cost. This would be particularly true of complex equipment where labor costs make up the largest portion of total cost. For example, the stainless steel going into a typical heat exchanger would probably cost only about two-thirds as much as the cost of labor.

Small increases in stainless-steel equipment costs probably would have little direct effect on the over-all sales picture. For example, at the present time well over 700 times more stainless steel than titanium is sold to the chemical industry. And, although half of the titanium sold to the chemical industry is tubing for heat exchange use, most of it is channeled to fabricators such as Pfaudler and Struthers Wells, which have specialized in its use. On the other hand, Charles Drake, chief engineer of Patterson Kelley's Process Heat Exchanger Division, says about 35% of the exchangers his firm makes are stainless steel, 60% copper and 5% other metals, such as inhibited Admiralty and carbon steel.

Titanium hasn't really been a direct competitor of stainless steel except in specialized cases in which corrosion rate was more important than first cost. For example, in concentrated 65% nitric acid, both stainless and titanium have the same corrosion rate at temperatures up to 250 F. But at 320 F, stainless has a corrosion rate that is 10 times higher, lasts one year in an application, compared with an estimated 10 years for titanium.

A Special Case: The situation could be somewhat different in the case of aluminum. Any increase in stainless price could focus attention on aluminum usage, which is now only about half that of stainless, even though it is considerably less costly.

Ellis Verink, manager of chemical and petroleum industries sales for Aluminum Co. of America, believes that up to now the aluminum industry may have been its own worst enemy in trying to promote process industries usage. Most engineers think of aluminum as lacking in strength and having unpredictable service characteristics—e.g. corrosion resistance. "We've talked about the problems too much instead of pointing out the advantages," says Verink.

For example, aluminum producers have always alluded to the potential danger in using turbine-type cleaners for heat exchangers made of aluminum. "We've failed to point out that we wouldn't recommend the use of any cleaning device that removes metal from heat exchanger tubes, whether that metal is aluminum, steel, brass or anything else," says Verink.

He points out that in some power plants, turbine cleaners have been used (even though not recommended) for aluminum surface-condenser tubes.

Aluminum cannot be used in caustic soda. But it has already found wide use in ammonium nitrate (about 30 installations). It has been used for handling many plastics raw materials and intermediates. And, according to Alcoa, three-quarters of all the piping in a number of the re-

fineries that have recently been built could have been made of aluminum.

As for lack-of-strength arguments, Verink counters that ASME codes have approved a number of grades as equivalent to mild steel. In addition, aluminum is penetrating the oil drillpipe field as a replacement for high-tensile-strength steel, although in this application it is about 40% more costly. Weight savings are the important factor.

In one case (a large-diameter storage tank for ammonium nitrate) where aluminum costs were high, Reynolds and Nooter Corp. worked out a design using tapered plate, which had previously found wide use in the aircraft industry. (Lukens Steel tried rolling tapered steel plate experimentally a number of years ago, found that for steel the weight savings were offset by the increased rolling cost.)

Cost Savings: While the rise in nickel price may not appreciably affect some of the stainless steels, it is certain to add considerably to the cost of alloys that are mainly nickel (e.g., Inconel is 78% nickel, Monel two-thirds nickel). What effect it will have on the Hastelloys (about 55-60% nickel) is hard to say, although some Hastelloys went up in price two months ago.

A number of fabricators feel that increases in the cost of the high nickel-using metals will not affect chemical industry usage, however. Reason: since such metals are already high in price, they are only used when nothing else will do. But price increases could spur developments in linings for piping, etc. (*CW, May 14, '60, p. 100*).

Another nickel-bearing metal that might be hit by the nickel price increase: Nine-Nickel (9% nickel steel). Lukens Steel, early developer of the steel for cryogenic applications (*CW, Nov. 7, '59, p. 43*) says it is still studying the situation. However, for many applications, aluminum is ready to step into the picture should the Nine-Nickel price go up.

Whether or not the nickel price increase will eventually show up as a significant factor in increased equipment prices remains to be seen. But there is no question that it will focus CPI attention on other metals that until now have not shared the popularity of stainless steel.



Goodrich-Gulf workers clean latex from heat exchanger plates.

Solving Tough Latex Poser

Because they call for tedious hand-cleaning (*picture above*), plate-type heat exchangers have largely been ruled out of applications involving highly viscous materials—e.g., styrene-butadiene copolymer latex.

But for Goodrich-Gulf Chemicals' Port Neches, Tex., plant, the use of plate exchangers is a project that is paying off at the rate of 3 million lbs./month of copolymer with less than one-third the floor space needed for ordinary shell-and-tube heat exchangers.

Between 800,000 and 1 million lbs. of the latex can be processed before heat exchanger cleaning is necessary. The longest run has been three weeks. Although the plates take two days to clean, Goodrich-Gulf is happy to consider the cleaning operation a normal part of production procedure. Cleaning time is actually reduced because in an ordinary shell-and-tube exchanger the tubes would have to be reamed out. And high viscosity, which ordinarily causes cleaning problems in plate exchangers, proved useful in several ways.

Latex is unstable, sensitive to heat and vigorous agitation. In the plate exchanger, which operates on the principle of rapid heat transfer obtained by maintaining a relatively thin, highly turbulent flow, the high viscosity of the latex reduces turbulence to the point where it does not affect stability. And the turbulence helps provide greater, more even heat transfer.

Here's how Goodrich-Gulf's process works:

Latex from the reactors is flashed to remove excess butadiene and stripped of excess styrene. It is then circulated through the plate heat exchanger and a vacuum tower. The vacuum tower helps cool the latex by evaporation of water, maintaining a relatively mild heating in the plate heat exchanger. Concentrated latex is bled off from the circulating stream and sent to storage for tank-car shipment.

In cleaning, the plates are removed from the unit, immersed in a caustic bath for 16 hours, then brushed with an acid paste and water-rinsed. Wooden chisels are used to remove heavy deposits.

Plate exchangers supplied by De Laval Separator Co. (Poughkeepsie, N.Y.) were first used in milk production. In the last few years service has been extended to include a number of chemical applications.

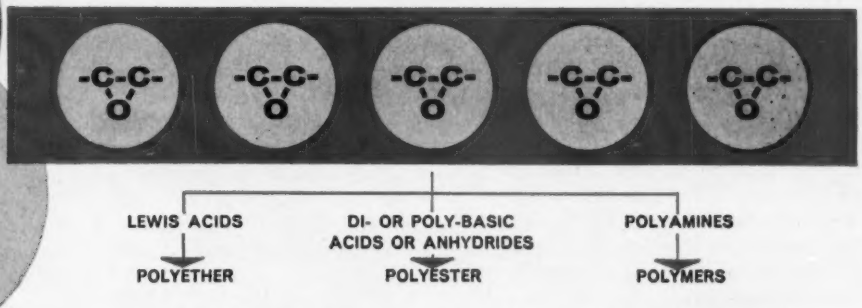
The first plate heat exchanger installed in the Goodrich-Gulf system

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Gardner Color	Less than 1
Gardner Viscosity @ 25° C.	V Max. (8.8 poises)
Saponification No.	176 Max.
Acid No.	0.3 Max.
Absorptivity @ 2.9 Microns (Corrected for Background)	0.020 Max.
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TP4

provided 1,000 sq.ft. of heating surface, required less than 11 sq.ft. of floor space, resulted in a net input of 7.5 million Btu./hour. The latex, at a flow rate of 700 gpm. of 45-48% solids material, was increased in temperature from 100 to 145 F using 3-psi. steam.

An indication of the unit's effectiveness: a second unit was added, not only to avoid production downtime for cleaning, but to increase over-all production as well. The second unit, larger than the first, takes less than 14 sq.ft. of floor space to deliver about 10 million Btu./hour of heat to the latex.

Computer for Huels

One of the first indications that the West German chemical industry is turning to the latest techniques in automation was disclosed earlier this month when Chemische Werke Huels AG. unveiled its new computer center at Marl.

The new center is slated to handle all of the firm's bookkeeping operations and a variety of scientific and engineering jobs (*CW Technology Newsletter, July 15*). It's said to give the German chemical maker the most advanced chemical industry computer setup outside the US.

The units installed—a high-speed, four-channel IBM 7070 computer with eight IBM 719 magnetic tape units and two IBM 1401 data processing units—are equivalent to those operated by a number of U.S. chemical companies.

West German chemical companies have been using electronic data processing for some time. Huels, for example, installed the new system (at $30,000/month rental cost) to replace an IBM 650 system. But no other German firm has such an advanced setup; in fact only Badische Anilin- & Soda-Fabrik is known to be working in the process control area.

Huels expects the computer center to help overcome a critical manpower shortage that is facing all West German industry. The system will process business data (e.g., payrolls, invoices, tax reports, inventory control, sales and purchasing). In addition, the center will be used for correlating and calculating laboratory and plant data in analytical, quality and production control.

EQUIPMENT

Canned Pump: A high-head, high-capacity canned pump is a new offering of the Corley Company (685 Myrtle Ave., Boonton, N.J.). The pump's only moving part is a magnetically driven rotor-impeller. Full flow of the pumped liquid is through the center of the motor, which increases the cooling, permits pumping rates of 100 gpm. at heads up to 92 ft. without overloading. All bearings are fully flushed as the liquid is pumped, eliminating a recirculating tube for rear-bearing lubrication.

•

Pressure Transducer: Consolidated Controls Corp.'s (Bethel, Conn.) new Ultradyne series of pressure transducers provide accurate gauge, absolute and differential pressure measurement at temperatures as high as 1000 F. The transducers have high nuclear-radiation resistance, can be used near and inside reactor cores, in contact with molten metals and close to the exhaust of gas turbines. Units have full-scale measurements from 0.6 to 5,000 psi. Accuracy over the temperature range of −65 to 1000 F is 2½%; room temperature accuracy is ½%; accuracy over any 250-degree span is 1%.

•

Heat-Sensitive Dryer: Dorr-Oliver Inc.'s (Stamford, Conn.) Dorrco Fluo-Solids System, using fluid-bed heating to remove water and recoverable organic solvents, is now being offered to petrochemical and plastics makers as a new method for drying heat-sensitive materials. Wet feed is introduced to the dryer continuously; dried material is removed at a single point through an automatic discharge valve. Fines carried off by the volatilized solvent are cycloned and returned to the dryer. Solvent is scrubbed, reheated and returned to the dryer to provide heat and bed-support gas; excess solvent is returned to the process.

•

Grinding Mill: Allis-Chalmers Mfg. Co. (Milwaukee 1) has redesigned its synchronized, dual-drive, vibrating grinding mill for easier maintenance. The mill's vibrating mechanism has been removed from the chamber, increasing bearing life and maintenance accessibility. The vibrating mechanism has been completely enclosed, eliminating a circulating lubrication system.

•

Gas Check Valve: Clark Bros. Co., division of Dresser Industries, Inc. (Olean, N.Y.) offers a new line of check valves designed for large-volume gas flow. The valves have no rotating, sliding, hinged and high-inertia moving parts. Backflow is controlled by stainless-steel leaves retained by keepers. Metal-to-metal contact eliminates reaction between gases and rubber or synthetic seals. Valves can be mounted at any angle, are available for pressures up to 1,000 psi. and 6- to 48-in. pipe sizes.

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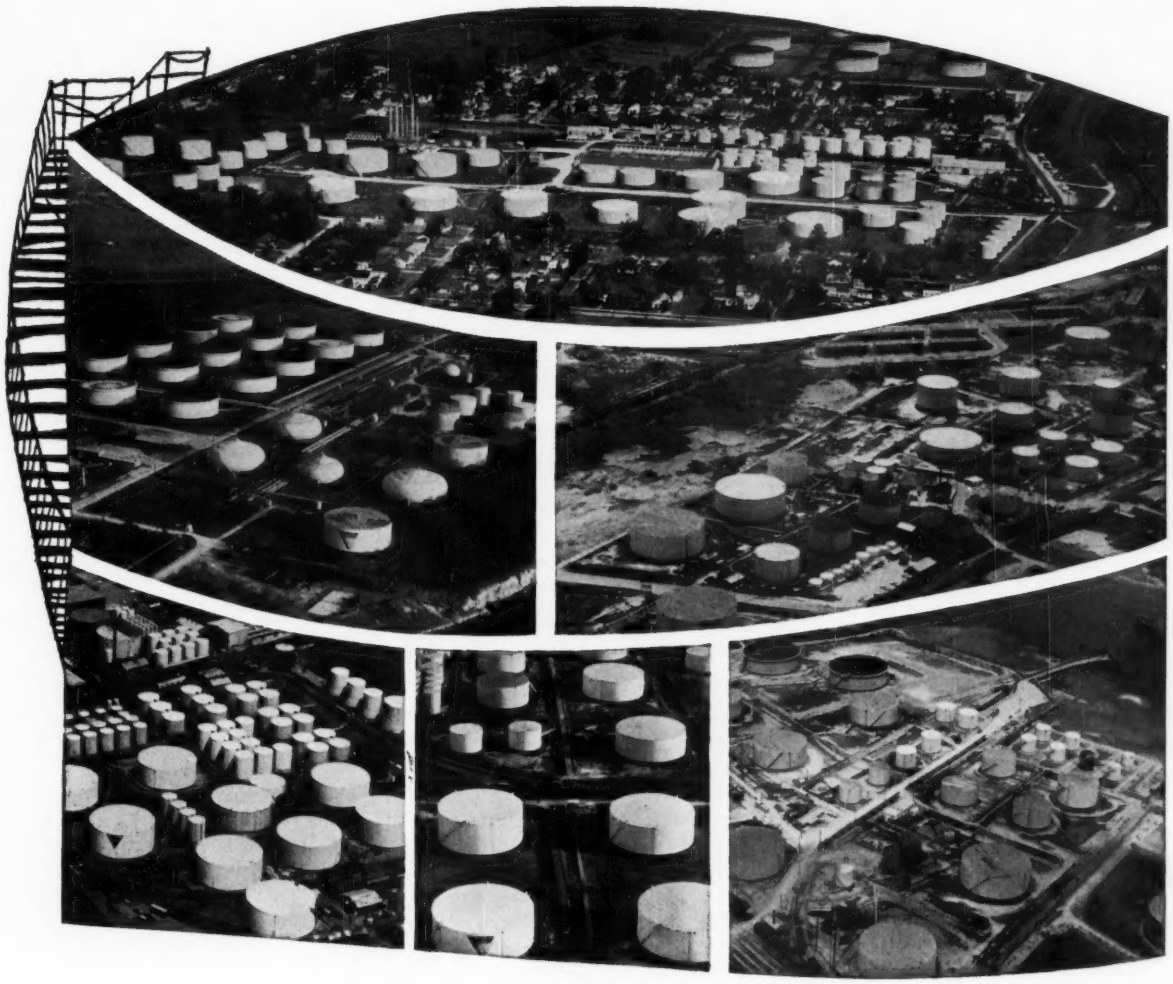
Power System: A self-contained power source that can be transported and operated by hand is a new offering of Aircraft and Missile Consultants (2722 Ardmore Ave., Manhattan Beach, Calif.). The device uses a number of small solid-propellant gas generators, which will produce cool gas to inflate units from 1- to 500-cu.ft. volume at pressures from 3 to 3,000 psi. It can also be used to generate high-pressure gas for operating pneumatic tools and other field equipment. Output is controlled; the system is said to produce large quantities of energy for intermittent use.

•

Power Transmission Clutch: Formsprag Co. (23601 Hoover Road, Warren, Mich.) is out with a new high-speed backstop clutch for power transmission in highly abrasive and other corrosive atmospheres where over-running at high speeds for long periods of time is common. Units, for mounting on conveyors and bucket elevators, provide over-running speeds on inner races from 1,800 to 3,000 rpm., have torque capacities of 140 to 1,900 ft. lbs. Special neoprene seals are used to withstand high speed and heat. In one field test on a Taconite ore conveyor, a unit. designated HSB, operated on over-run at 1,200-1,800 rpm. on a 24-hour schedule for nine months.

•

Flat Wire Belting: The Cambridge Wire Cloth Co. (Cambridge, Md.) has a new line of flat-wire belting that can be used with sprocket and friction drives. Belts up to 12 ft. wide can be formed from carbon, galvanized and stainless steels. Mesh sizes: 1 x 1 in., ½ x 1 in., ½ x ½ in.



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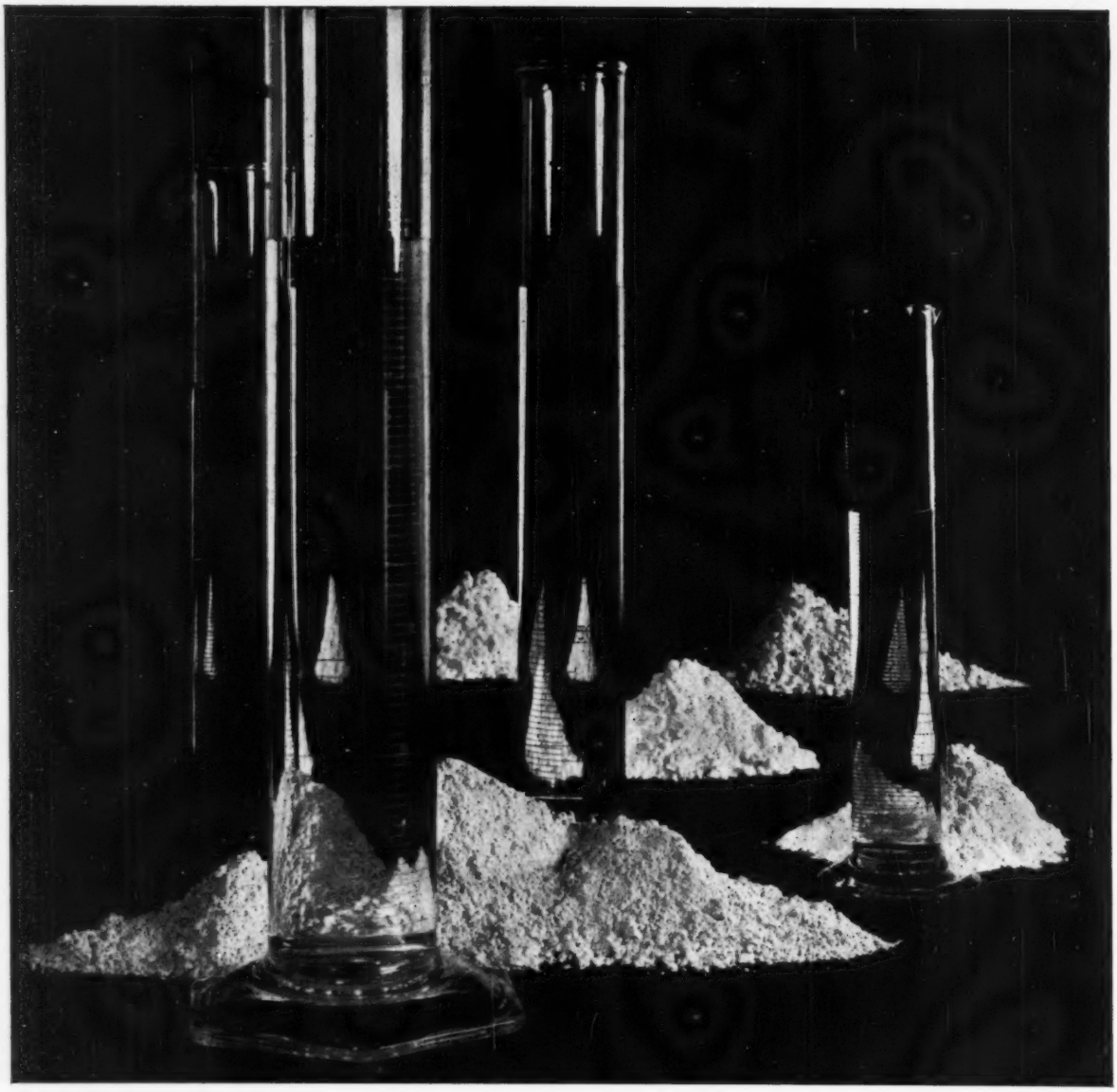
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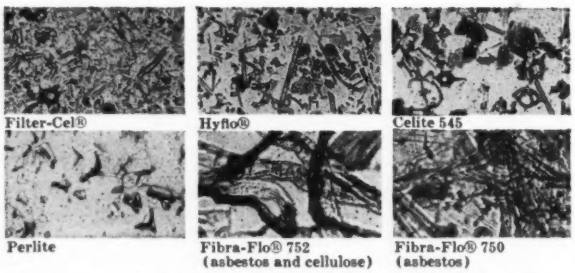


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These photomicrographs show the range of characteristics available with Celite filter aids.

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Growing mission for CPI sales staffers: convincing buyers to accept bulk solids deliveries.

Selling PA's on Bulk Solids Buying

The confident chemical seller pictured above typifies the growing group of bulk delivery advocates. His mission is to win customers over to ordering dry chemicals in bulk (truck or rail) rather than in unit-package lots. His main sales point: bulk delivery can be the biggest single way to cut the cost of pulverized and granular solids.

The savings—up to $11/ton in the case of phosphates—are strong arguments indeed for marketing management in new areas of CPI to try bulk ordering. As a result, this procedure is fairly common among users of plastic resins, phosphates, silicates, fertilizers, pigments, etc. But bulk delivery is still not as typical of the dry product field as it is of the liquid segment.

Surprisingly, it is the supplier, not the customer, that has taken the rapidly matured technology of dry bulk solids handling (largely from the cement and feed industries) and applied it more broadly. Reason: in highly competitive solids markets, the slightest saving in delivery cost or customer service can be the critical factor in winning a buyer.

Automation, too, is helping accelerate the dry bulk trend—the big savings come where high volumes are handled. Chemical producers complain, however, that equipment makers aren't promoting their machines aggressively.

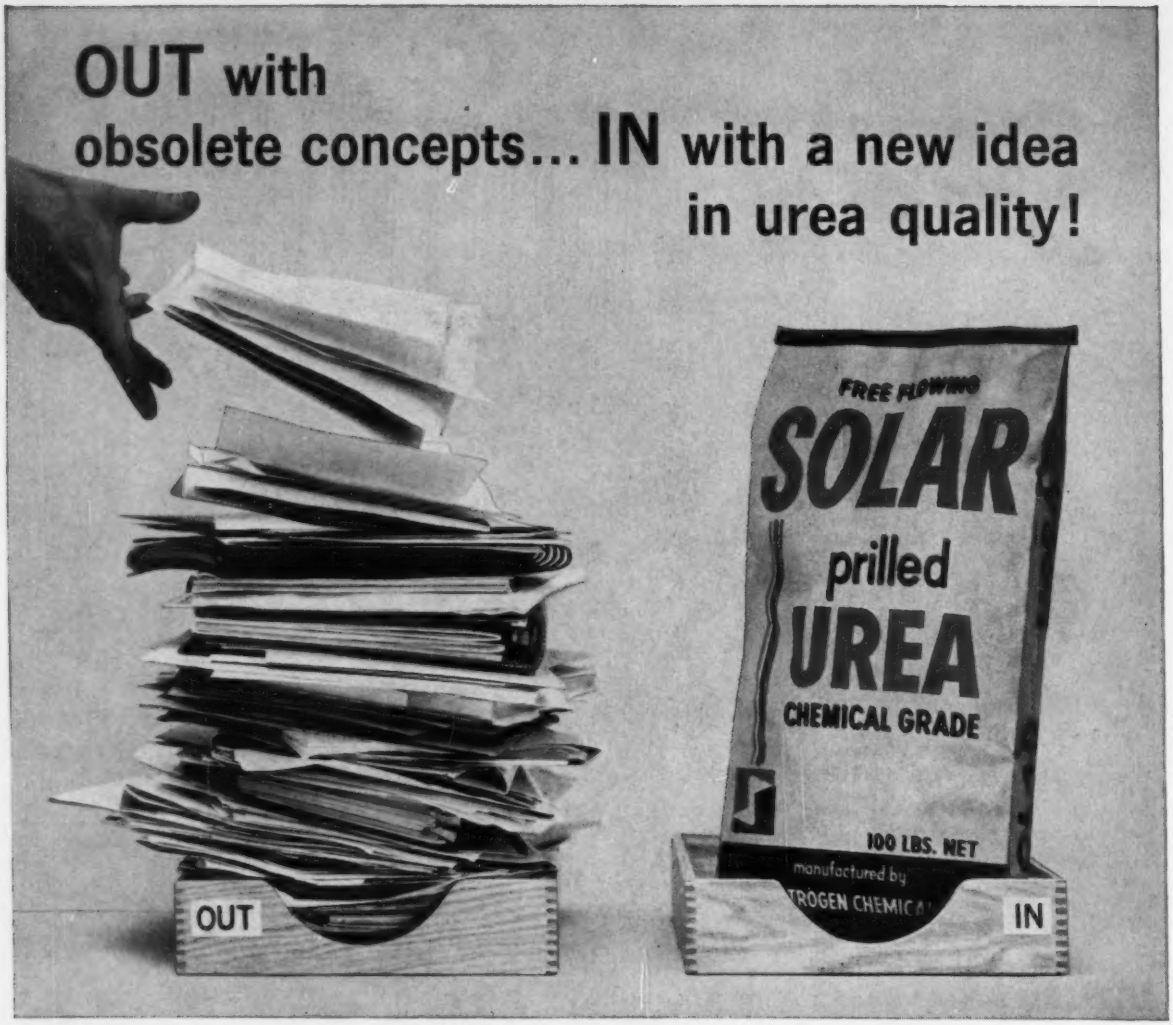
Challenge: The big job facing most dry chemicals producers is conversion of the small-volume user to bulk purchases. Most big consumers are quick to see the advantages—but the smaller firms prefer to stick with bagged or drummed products, largely because they hesitate to make the investment in bulk-handling facilities, which can range upward from several thousand dollars.

Nevertheless, the dramatic growth of dry bulk shipping, which has resulted in significant expansion of truck and rail bulk-handling facilities, indicates headway is being made among both large and small buyers.

Two examples point up the rate of this growth:

• National Lead Co., which now operates three pneumatic trucks for its several grades of litharge (lead oxide), plans to double this fleet—

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I-2

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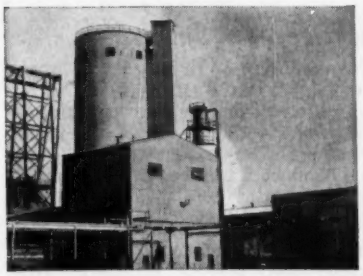
NEW SOHIO METHOD HOLDS KEY TO SUPERIOR UREA QUALITY

HIGH PURITY LEVEL OF NEW SOLAR UREA MEETS COMPLETE RANGE OF APPLICATIONS

LIMA, OHIO — Superior quality is the major characteristic of a process now being used by Solar Nitrogen Chemicals, Inc., in the production of high-purity Solar Urea. This new manufacturing method is the Vulcan-Inventa process with a Stora-Vulcan evaporator. So dramatic is performance that urea users are developing new yardsticks for judging urea quality — particularly for applications in U-F resins, molding powders, textiles and coatings.

Compact system simplifies synthesis

The simplicity of the Vulcan-Inventa process combined with a Stora-Vulcan evaporator virtually eliminates recycle streams and minimizes contamination and biuret formation. The careful selection of materials results in an absence of heavy metals.



Urea melt is transported at low temperatures to retain high purity and to avoid biuret formation. Both concentration and drying are accomplished simultaneously in the unique Stora-Vulcan evaporator. The use of an inert carrier permits evaporation and stripping at low temperatures — again avoiding biuret formation.

Net result

Performance of Solar Urea proves its value in applications previously requiring crystalline urea. Yet Solar Urea is prilled, retains its free-flowing, easy-to-handle properties even during prolonged storage. Further safeguards in storage and packaging facilities mean that Solar Urea comes to you as pure as it was made.

For a production sample of new Solar Urea, write to Sohio Chemical Company, P.O. Box 628, Lima, Ohio.

which has been in operation less than a year—within the coming four to six months.

• Pullman-Standard Division of Pullman, Inc. — the world's largest builder of freight cars—is now entering the competition for a chunk of the business in rail cars for dry bulk chemical materials. The company now sees enough growth potential to justify introducing a new center-unloading hopper car as well as a 70-ton, 800-cu.-ft. Air Jet car with three tear-shaped bins.

General American Transportation Co. (GATX)—leader in dry bulk cars —tells CHEMICAL WEEK it now has some 5,000 of its Air Slide cars in service (cars that handle finely divided solids by "fluidizing" them in an air-jet) and nearly 280 of its Dry-Flo-Chem cars for granular materials. But within a few years, GATX will have a fleet of 8-9,000 Air Slide cars and perhaps 2-3,000 of the Dry-Flo models in regular service in the U.S.

Trucker, Too: Bulk truck movements, particularly, have shown tremendous growth within the last two years. It was less than 19 months ago —in Jan. '60—that the first common carrier trucker, Robertson Tank Lines, Inc. (Houston, Tex.), sought permission from the Interstate Commerce Commission to haul bulk solids by truck. Nearly 50 CPI firms supported that bid, and since then, Robertson has acquired more than 20 pneumatic trucks for this operation. The company says dry commodities now represent 5-10% of its business, and that growth has been so rapid that dry shipments may predominate in about three years. The National Tank Truck Carriers Assn. indicates that nearly 30% of all tank trucks now produced are for dry bulk materials.

Barge terminal operators are beginning to note the CPI's bigger dry chemical orders. Massive terminals for cement have long been used. Now, for the first time, two major terminal operating firms—Hess Terminals (Houston) and GATX (Chicago)—are both "seriously" considering building such facilities for other dry chemical products.

Selling Delivery: Despite their progress so far, companies supplying in bulk must still make a strenuous effort to get new customers to try the service. Most such sales teams are prepared to make a barrage of personal calls and demonstrations, distribute special literature and, in at least one instance, put on a 10-minute color film show.

Monsanto Chemical Co.'s Inorganic Division, for example, is now pushing bulk sales of sodium phosphates. It claims its most effective plan is to take potential buyers out to either its Long Beach, Cal., or Carondelet, Mo., (near St. Louis) plants where full-scale demonstration units are set up.

Just last week, the Inorganic Division released a new brochure designed to tell the same story a little less expensively.

Monsanto's Plastics Division is also an aggressive proponent of bulk handling, and it, too, counts heavily on literature—it has published a pair of reports on the advantages of bulk-handling installations for customers and on receiving plastics in hopper-car quantities.

National Lead is the company using the 10-minute color movie to tell the bulk story. The film's big point: a truckload of litharge can be put into the customer's plant in less than 15 minutes—it takes hours to unload the same tonnage packed in 600-lb. metal drums.

Advocates of bulk buying stress savings to their customers. But there are clear-cut economies for the supplier in cutting down packaging, inventory management of packaged stocks, and costly, inefficient delivery methods.

And suppliers soft-pedal their aims of reducing their customers' order-splitting, or winning a bigger slice of his total business.

Their sales pitches uniformly emphasize customer benefits. Here's how they do it:

(1) *Faster Delivery.* Many CPI solids sellers contend they can deliver truckloads in bulk faster than they can deliver truckloads of drums. On the other hand, rail car deliveries in bulk would probably be no faster than in drums or bags. Shorter unloading time is still a possible advantage—but the high-volume, slow rail movement might give the customer an inventory problem.

(2) *Cheaper Delivery.* Since bulk handling is less costly both to the seller and to the buyer (primarily it requires shorter unloading time), some sellers have bulk discounts. Phosphates, for example, now sell for $11/ton less in bulk than in small lots; last

year the differential was $8/ton. Bulk loads of soda ash are $6/ton less than packaged soda ash.

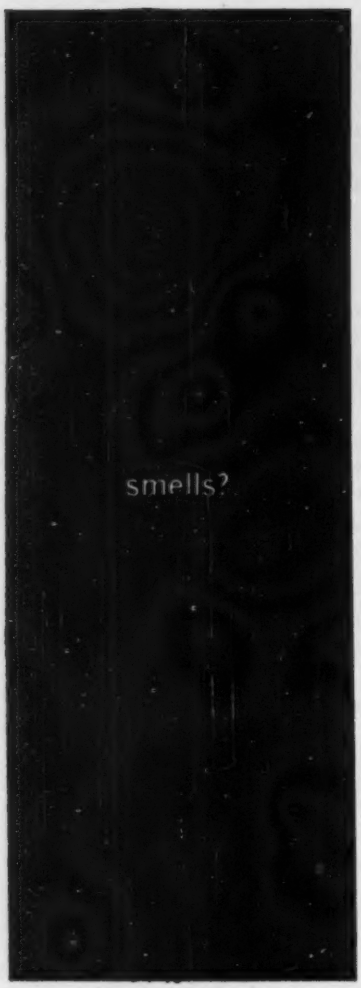
National Lead keeps a running check on its actual savings from bulk and accordingly varies its pass-along discounts—which range from 3-5% of the price of litharge. According to Henry Whitson, assistant to the paints, pigments and chemicals sales manager, National seeks mainly to maintain its current net profit and to pass on virtually all savings to customers.

(3) *Product Quality.* Plastics marketers are likely to tout bulk handling as a way to protect product cleanliness and maintain the preferred moisture content. And National Lead promotes the free-flow characteristics of litharges that are bulk-truck delivered, says that they can be processed into better quality storage batteries for this reason.

(4) *In-plant Storage and Handling.* Among all bulk proponents, however, the biggest emphasis is placed on savings in floor space and labor. National Lead's Whitson figures a buyer of materials in bulk can get by with 10-20% of the floor space needed for bag or drum stacking. And Olin Mathieson's Blockson Division sales staffers point out that bulk delivery helps sidestep some of the touchy labor problems that plague plant managers. Since manual drum or bag handling is virtually eliminated, labor contracts don't have to deal with such problems.

Outlook: Despite the rapid growth in bulk handling in recent years, most observers figure the really big gains still lie ahead. And, while proponents have numerous cogent arguments for encouraging this progress, they also have some difficult problems. Among them: resistance from small, undercapitalized businesses that don't feel they can afford the necessary equipment investment.

But most chemical marketers feel that the growing role of bulk delivery is warranted by the facts. Monsanto tells CHEMICAL WEEK that so far, it's had "excellent" sales volume increases, based both on new business and on a larger share of old customers' purchases. If other CPI solids sellers and their customers are as optimistic about the future of bulk, it may not be too long before bulk solids delivery is necessary to satisfy most customers' requests.



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Composition

Empol 1018 has a typical composition of 83% dimer acid (C_{36} aliphatic dicarboxylic) and 17% trimer (C_{54} tricarboxylic). Only a trace of monobasic acids are present. with specifications listing 1% maximum. Empol 1018 is not only lighter-colored than Empol 1022, but also has less monobasic and trimer acids, which may affect cross-linking, viscosity and gellation of its derivatives.

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With its light color and low monobasic properties, Empol 1018 will find excellent application in polymers such as polyesters, polyamides, esters, ester - based urethanes, varnishes, epoxy ester coatings and other uses where its light color is valuable.

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The combination of long chain length and high molecular weight of dimer acid gives it characteristics uniquely its own. Its alkaline soaps are excellent emulsifiers, and the free acid is the basis of a number of anti-rusting compounds.

In polymers, it tends to increase flexibility. The appreciable amount of trimer acid present in Empol 1018 can form a considerable amount of cross - linkages, yielding polymers with good toughness and alkali resistance. Through-dry of long-oil alkyds and epoxy ester varnishes is also speeded by dimer acid.

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Empol 1018 is made from domestic raw materials and is available for immediate shipment in tankcars or drums. Although it enjoys both color and low-monobasic advantages over Empol 1022, it sells for only 1¢ a pound more at 26¼¢ in tankcar quantities, East of the Mississippi.

Descriptive Literature

For complete description and specifications of Empol 1018 Dimer Acid, request Bulletin 421. Write Emery Industries, Inc., Dept. I-7B, Carew Tower, Cincinnati 2, Ohio.

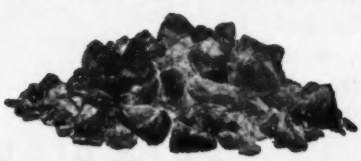


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Polymer Fact Book

CPI marketers who keep an eye on developments in the fast-moving plastics and rubber industries now have another market research aid to simplify the task. It's *Polymer Market Abstracts* (PMA)—a new marketing service offered by Foster D. Snell, Inc., New York-based consulting firm.

The new publication—a monthly—is a companion to Snell's widely used *Chemical Market Abstracts* (CMA). It is, in fact, a separate publication presenting data that has previously been a part of CMA. This data will continue to be included in CMA, according to the company; the separate polymer edition is simply a cheaper, more convenient form — there's no need to wade through the 2,000 items that characterize a typical monthly issue of CMA.

Brief Form: Like its larger companion, PMA will derive its data from more than 200 business papers, government documents, company bulletins and other sources. However, it will cost far less: $36/year, vs. CMA's second-year rate of $120/-year.

PMA will concentrate on industrial markets, will list virtually no items or manufacturers of consumer products. Major polymer materials, such as polyethylene or polypropylene, will appear in separate sections listing production, consumption, import-export figures, new plants, patents or product information and other significant industry news.

To introduce its new abstracts journal, Snell is offering subscribers a Polymer Market Report, intended to bring them up to date on the rubber and plastics markets.

DATA DIGEST

• **Chlorinated Paraffins:** New chart lists physical properties of 13 paint and plastic grades of chlorinated paraffins. Suggested applications: flame retardants, extenders, plasticizers and tackifiers. Dover Chemical Corp. (West 15th St., Dover, O.).

• **Hydrocarbon Resins:** Two technical brochures describe formulations of resins for adhesives (No. 505-4) and rubber (No. 505-3). Included is a list of the company's resins for specific compounding requirements. Vel-



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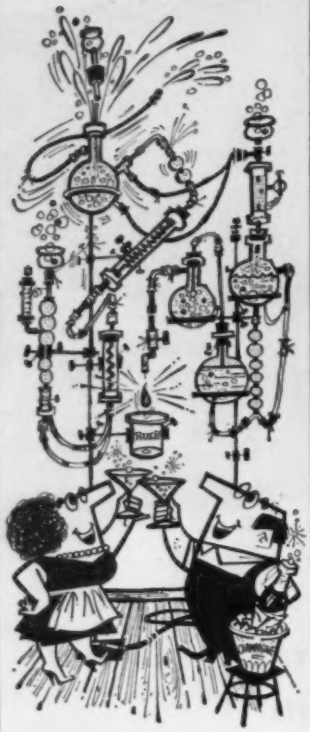
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sicol Chemical Corp. (330 East Grand Ave., Chicago 11).

• **Lithium Chemicals:** New technical data bulletin describes commercial and experimental lithium chemicals for catalysis, multipurpose greases, metallurgy, ceramics, electronics, air conditioning and other fields. Physical and chemical properties are listed, along with suggested applications. Foote Mineral Co. (18 West Chelten Ave., Philadelphia 44).

• **Sodium Tripolyphosphate:** Bulletin (No. I-219) outlines use of this product to increase waterflood injection rates and speed oil recovery in secondary oil recovery projects. Physical and chemical properties are listed, with an appendix of evaluation procedures. Inorganic Chemicals Division, Monsanto Chemical Co. (800 North Lindbergh Blvd., St. Louis 66, Mo.).

• **Pharmaceutical PVP:** Technical brochure (TA-67) outlines uses of polyvinylpyrrolidone in the pharmaceutical industry. Typical uses: a tablet binder and film-coating agent, color receptor, dispersant for many hydrophobic materials, makes "wet" granulation techniques possible in anhydrous solvent systems, etc. Antara Chemicals, division of General Aniline & Film Corp. (435 Hudson St., New York 14).

• **Hydrocyanic Acid:** Safety data sheets (SD-67, revised) describe properties, safe handling and use practices, cleaning methods, waste disposal and first aid procedures for working with hydrocyanic acid (HCN). Manufacturing Chemists' Assn., Inc. (1825 Conn. Ave., N.W., Washington, D.C.).

• **Polyester Resins:** New group of booklets (Nos. 364, 392, 420, 442, 450 and 451) lists physical and chemical properties of polyester and acrylic-modified polyester resins. Other data: suggested formulations for various applications, curing characteristics and specific properties of the cured resins. Plastics Dept., Rohm & Haas Co. (Washington Sq., Philadelphia 5).

• **Gibberellin:** Ten-page data sheet (No. 558) cites physical, chemical, biological and physiological properties of a mixture of nine closely related plant hormones. Primary active ingredient: gibberellic acid. Current uses: malting of barley, pest control, seed treatment for other agricultural crops. Chas. Pfizer & Co., Inc. (235 East 42nd St., New York 17).



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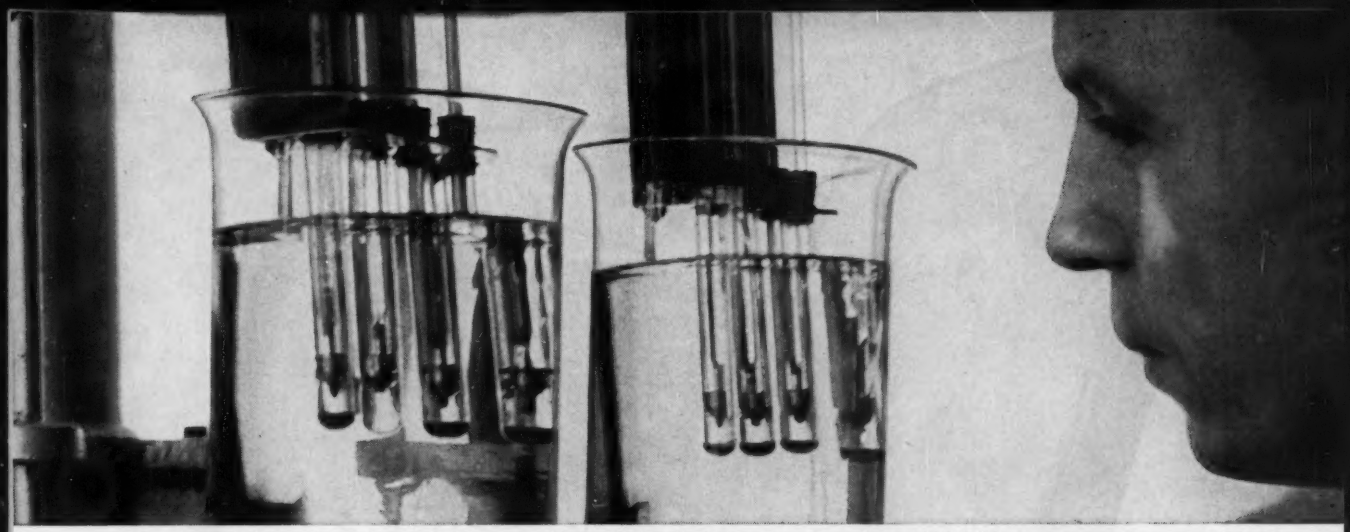
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BULLETIN:

Shell reveals the remarkable new component in Darina Grease that helps it save up to 35% on grease and labor costs

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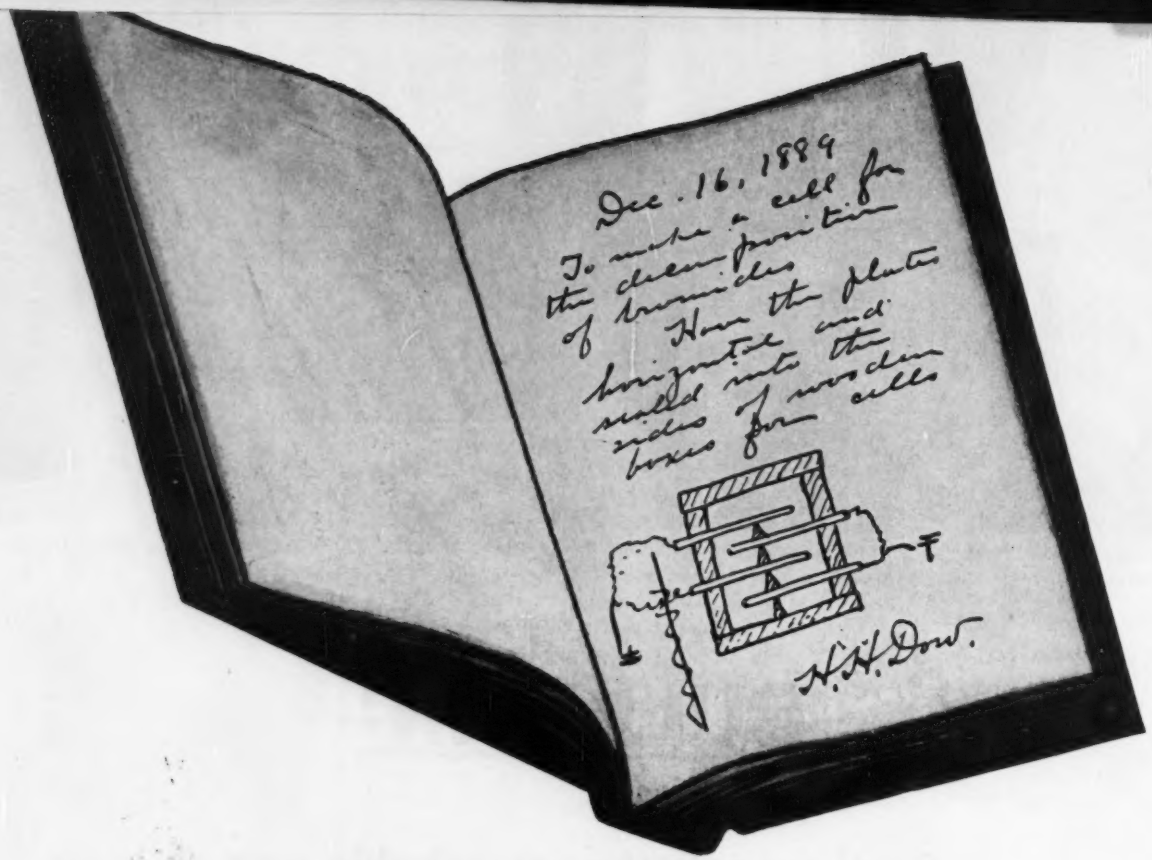
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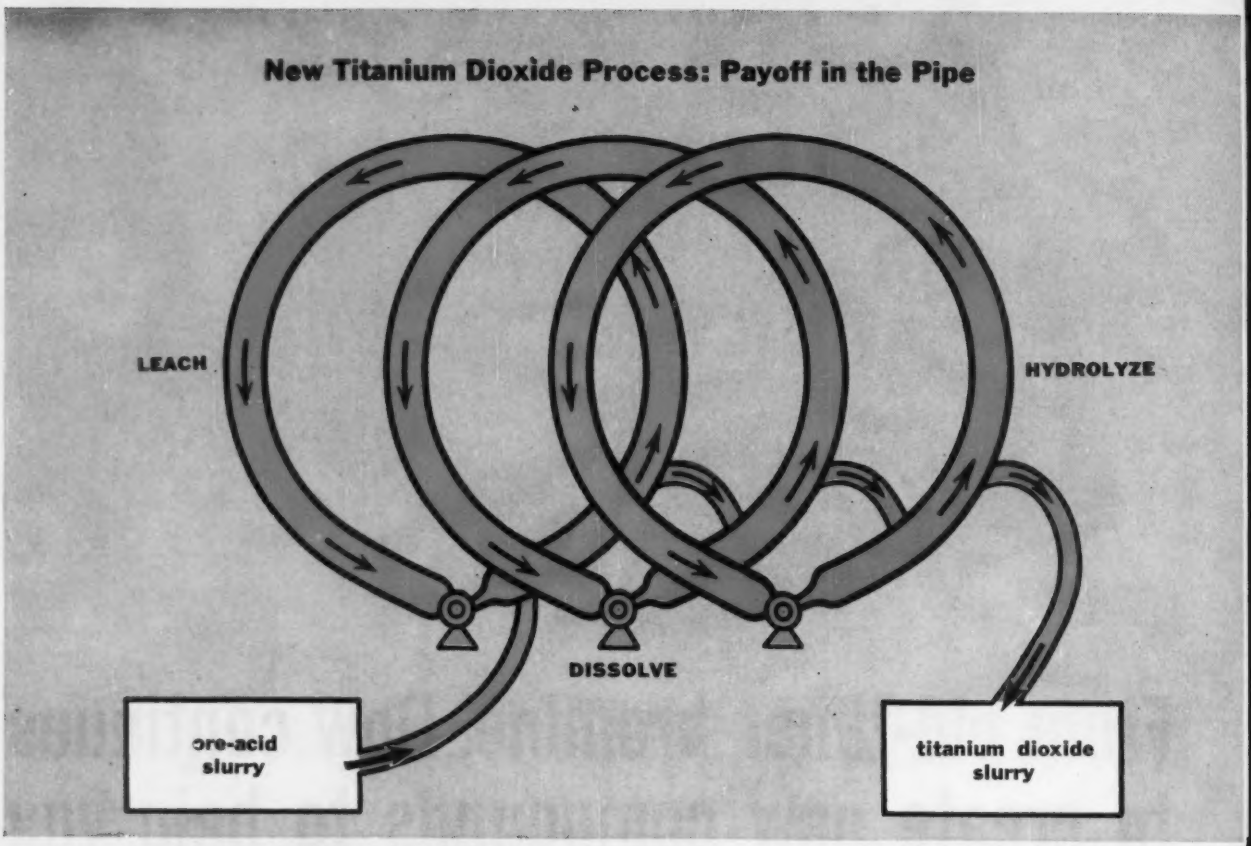
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Pressuring Ilmenite for Pigments

In Baie St. Paul (Quebec) this week construction crews are pushing ahead on a new plant that promises to bring a radical change to titanium dioxide processing. The 20-ton/day plant, under construction for Continental Titanium Corp. (Montreal), bypasses the batch system used by all U.S. producers; instead it extracts titanium dioxide from ilmenite ores on a continuous basis. Because the new process can utilize leaner ores and requires less acid than that used in existing plants, it offers greater flexibility—and economy—in operation.

Pressure is the key to the new process, invented by Continental Titanium's vice-president, Nicholas Soloducha (*CW Technology Newsletter, July 15*). A recycle system consisting of steam-jacketed pipes (the design is covered by Canadian Patent 610,334—*see drawing above*) is substituted for the batch tanks of the conventional system. The recycle system keeps ore and sulfuric acid solutions moving under pressure, controls temperatures above the atmospheric boiling point, and bypasses the batch step in which solid sulfate cake is formed.

Until the commercial plant swings into operation later this year, acid consumption cannot be pinpointed. But on the basis of pilot-plant data, Soloducha expects to reduce acid consumption by about one-third of that required in conventional plants.

His capital investment figures are also favorable. Studies show that a 30,000-tons/year plant would cost $10 million, or about $330/annual ton of capacity. Investment costs in conventional plants range from $600 to $1,000/annual ton, depending on plant size (the smaller the plant, the higher the costs). The costs for Continental Titanium's incoming plant, which is rated at 6,600 tons/year, will likely be about $400/annual ton.

At present, it's hard to say where the new process will fit into the overall production picture. Observers are waiting to see how the plant fares in full-scale operation. Also, Continental Titanium has not yet decided whether it will license the process. However, if the process proves out, it stands a good chance of finding a place in new plants to be built in the years ahead.

Looking at the Old: All domestic plants—with the exception of Du Pont's unit at New Johnsonville, Tenn., which uses a process involving vapor-phase oxidation of titanium tetrachloride—base production on the traditional sulfate method (*see Dimension, p. 72*). Ore is digested in concentrated sulfuric acid, with air agitation, to form a cake of solid sulfates. The cake is dissolved in water, heated to the temperature at which the ti-

A new, three-step route utilizing circuits of pipe adds flexibility to the classic sulfate process for titanium dioxide.

tanium sulfate hydrolyzes to titanium dioxide, and the resulting titanium dioxide is separated and finished into pigment form.

This process leaves something to be desired. It consumes concentrated acid without any acid recovery. Also, it requires labor-consuming batch methods that involve the mixing of acids and ores to form a solid cake, which must then be put into solution. And obtaining the correct crystal size poses a control problem during the hydrolysis reaction.

Looking at the New: Although details of the Soloducha process have been withheld pending the issuance of further patents (Canada 610,334 covers only equipment design), enough information is available to outline the basic method. Untreated ilmenite ore is fed directly to the first processing stage with dilute sulfuric acid. (Continental Titanium plans to use 40-45% acid but says it's possible to use acid in a concentration range of 25-55%). The ore-acid mixture is partially dissolved at about 490 F and 300 lbs./-sq. in., as sulfur dioxide is introduced to reduce the ferric iron to ferrous. The resulting slurry is separated in self-cleaning thickeners and hydrocyclones to yield an intermediate solids concentrate with low iron (5% ferric oxide) and high titanium dioxide (over 80%).

From this leaching step, the concentrate is mixed with more acid until it is completely dissolved into ferrous and titanium sulfates. As in the leaching operation dissolving is carried out in circuits of steam-jacketed pipes arranged with multiple circulating pumps and bypasses to prevent "dead spots" where solids could settle out of the circulating solutions.

Hydrolyzation — the most critical step in pigment production—follows complete dissolution. Titanium sulfate does not react (hydrolyze) with water at temperatures below 185-190 F. But at this temperature, the hydrolysis (titanium sulfate plus water yields titanium dioxide plus sulfuric acid) is very rapid up to the point at which 30% of the titanium sulfate has been converted, producing an immediate precipitate. At this 30% point, the reaction produces enough free sulfuric acid to act as a buffer solution, slowing the hydrolysis of the remaining 70%.

These two reactions, before and after the 30% point, produce markedly different crystals. Those precipitated immediately from the first reaction are large, contaminated with other metals, and do not make good pigments (they have poor hiding power). Those from the second reaction are smaller, purer, and make better pigment; they are not formed until the solution is cooled.

Thus the key is to avoid the initial fast reaction in the hydrolysis step. The Soloducha process does this by injecting the feed for the hydrolyzing step directly into a circulating volume of solution that has already been partially hydrolyzed. The feed is quickly heated to reaction temperature, but the presence of the free acid in the circulating solution prevents runaway reactions. Time for hydrolysis is about one hour.

Following the hydrolysis step, the solution is injected into a hydrolyzed mixture circulating at about 140 F. This cools it quickly and, under close control, yields the preferred crystal size. After the precipitate is formed the solution is filtered, and the pigment is finished, similar to that in the conventional processes.

Underwriting Investment: Before investing in the Baie St. Paul plant, a pilot plant was built to prove out this pipe-circuit design. Following this, Continental Titanium sought capital for a full-scale plant. And the holding corporations—La Maison Bienvenu (Montreal) and Industrial Holding Corp. (New York)—requested independent evaluation of the process.

The evaluation was made by P. L. de Bruyn of Massachusetts Institute of Technology, who reports the Soloducha process can reduce Continental Titanium's costs of producing pigment by 20-30%, depending on the size of its plant. Reasons:

- Cheaper raw materials. Starting with an ilmenite ore assaying about 43% titanium dioxide and 51% iron oxide, the process can turn out a 99.9%-plus titanium dioxide pigment without ore beneficiation prior to leaching.
- Lower acid consumption. Employing cheaper dilute acid for the dissolution of the ore and recycling some of the acid liberated during the hydrolysis, the new process reduces sulfuric acid consumption, a major operating cost.
- Reduced labor costs through continuous processing.
- Reduced investment. Engineering estimates showed the investment costs to be up to 30% less, depending on plant size.

This favorable report led to the floating of a $500,000 bond issue by the holding companies to pay for a prototype plant capable of 3-5 tons/-day. However, economic studies favored direct expansion to the 20-tons/-day plant currently under construction.

Bypassing Beneficiation: A big ad-

U.S. Titanium Dioxide Producers and Capacity

	tons/year
American Cyanamid	
Piney River, Va.	18,000
Savannah, Ga.	72,000
Du Pont	
Edge Moor, Del.	55,000
Baltimore, Md.	85,000
New Johnsonville, Tenn.	45,000
Glidden	
Baltimore, Md.	12,000
Hawkins Point, Md.	48,000
National Lead	
Sayreville, N.J.	167,000
St. Louis, Mo.	108,000
New Jersey Zinc	
Gloucester City, N.J.	23,000
Total	**633,000**

vantage of the process is that it can operate on leaner ores. Ilmenite ($FeTiO_3$) theoretically contains a maximum of 53% titanium dioxide. In the U.S. about 99% of the ilmenite produced is made into pigment; and about 80 times as much ilmenite is produced as is rutile, the ore from which most titanium metal is extracted.

The ilmenite is found as sand or as rock. From sand (or alluvial) deposits, it is concentrated, dewatered, dried, titanium-bearing minerals separated electrostatically and, finally, is treated on induced-roll magnetic machines to obtain an ilmenite product of about 60% titanium dioxide.

Rock deposits are upgraded to about 45% titanium dioxide on magnetic tables, then sintered to feed blast furnaces, from which the slag, assaying about 70% titanium dioxide, is recovered. These treated ores and slags represent an intermediate cost of $45-60/ton to titanium dioxide producers.

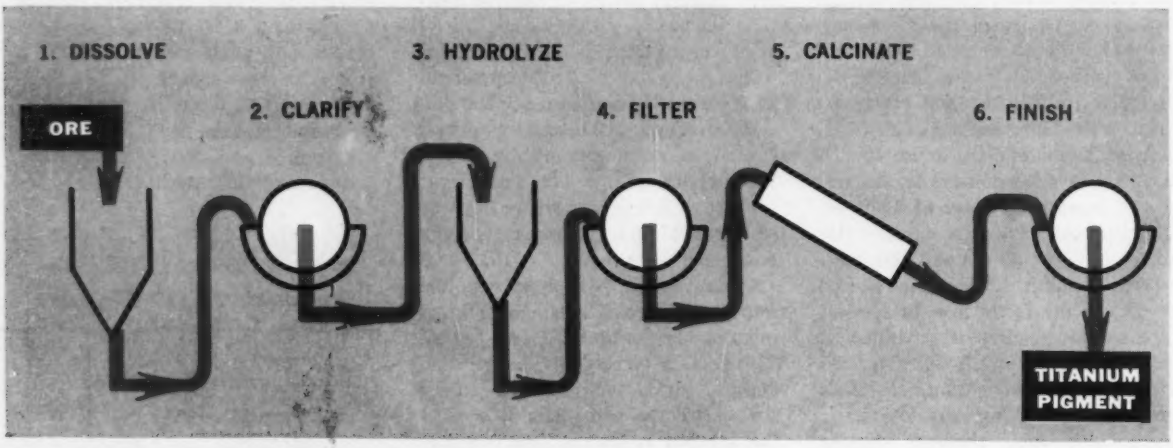
By contrast, the ore feeding Continental Titanium's new plant will assay 43% titanium dioxide. Prior to the leaching step, ore treatment costs are estimated at about $13/ton.

Outlook: The new process will vie for installation in new titanium dioxide plants rather than existing ones, where investment has already been made. The U.S. Bureau of Mines estimates that output of titanium dioxide in mined ores will reach about 800,000 short tons/year by '70. Estimates for '60 place the corresponding production at about 550,000 tons. Total U.S. capacity is 633,000 tons/year (*see table p. 71*). It's obvious that new capacity will be required in the next 10 years.

The optimistic growth picture is due to expanding markets for white titanium pigment in paints, lacquers, plastics, paper, floor coverings, rubber, coated fabrics and textiles. Its high opacity and chemical inertness permit it to be used in almost every variety of plastic, resin and molding powder except urea and thiourea.

Although Continental Titanium's process is still awaiting its commercial debut, experience to date indicates that it should be in a position to bid for a slice of the additional titanium dioxide capacity that will be needed in the U.S. during the next 10 years.

DIMENSION



The Sulfate Process: Classic Six-Step Route

Except for one Du Pont plant that uses vapor-phase oxidation of titanium tetrachloride, all major titanium dioxide pigment producers use the classic "sulfate process." In this process, beneficiated ores pass through six stages.

First: Ore is fed into large lead-lined tanks, where it is digested with concentrated sulfuric acid (93.19%). A typical batch includes about 40,000 lbs. of ore and 50,000-60,000 lbs. of acid. This mixture is agitated with air jets for 15-30 minutes until a cake of honeycombed structure is formed.

This cake, mostly sulfates of iron and titanium, is then put into solution by adding either water or dilute acid under carefully controlled temperature and concentration. And iron scrap (1 lb./100 lbs. of ore) is added to the solution to reduce dissolved iron from the ferric to the ferrous state.

Second: The solution is treated to remove traces of undissolved minerals. Coagulating agents (such as proteinaceous materials) are added; the resulting solids are allowed to settle and the batch is decanted. The decanted solution is cooled to about 40 F to crystallize iron sulfates. These are filtered out, and the clarified solution is concentrated under vacuum.

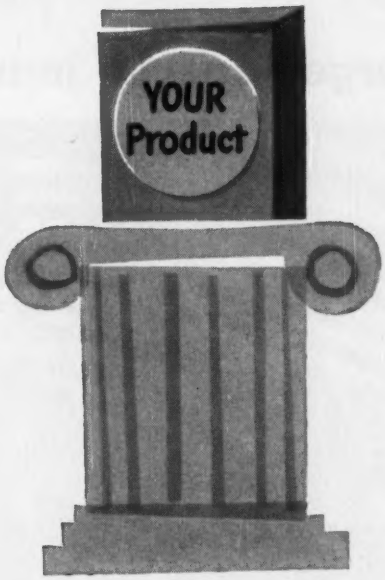
Third: The concentrated solution is heated to about 200 F and mixed with one-fourth its volume of water. Hydrolysis occurs as the resulting solution is brought to its boiling point and held for 3-5 hours under careful control of pH and temperature. Crystal nuclei are added to seed the formation of titanium dioxide crystals.

Fourth: The hydrous titanium dioxide precipitate is separated from the solution in a battery of filters, is washed and treated to remove traces of sulfuric acid.

Fifth: Calcining in a rotary kiln at about 1800 F.

Sixth: The calcined white pigment is finished according to end-use requirements. Finishing includes air blowing, grinding in ring-roll or pebble mills, and slurrying with alkali silicate or phosphate followed by pulverizing.

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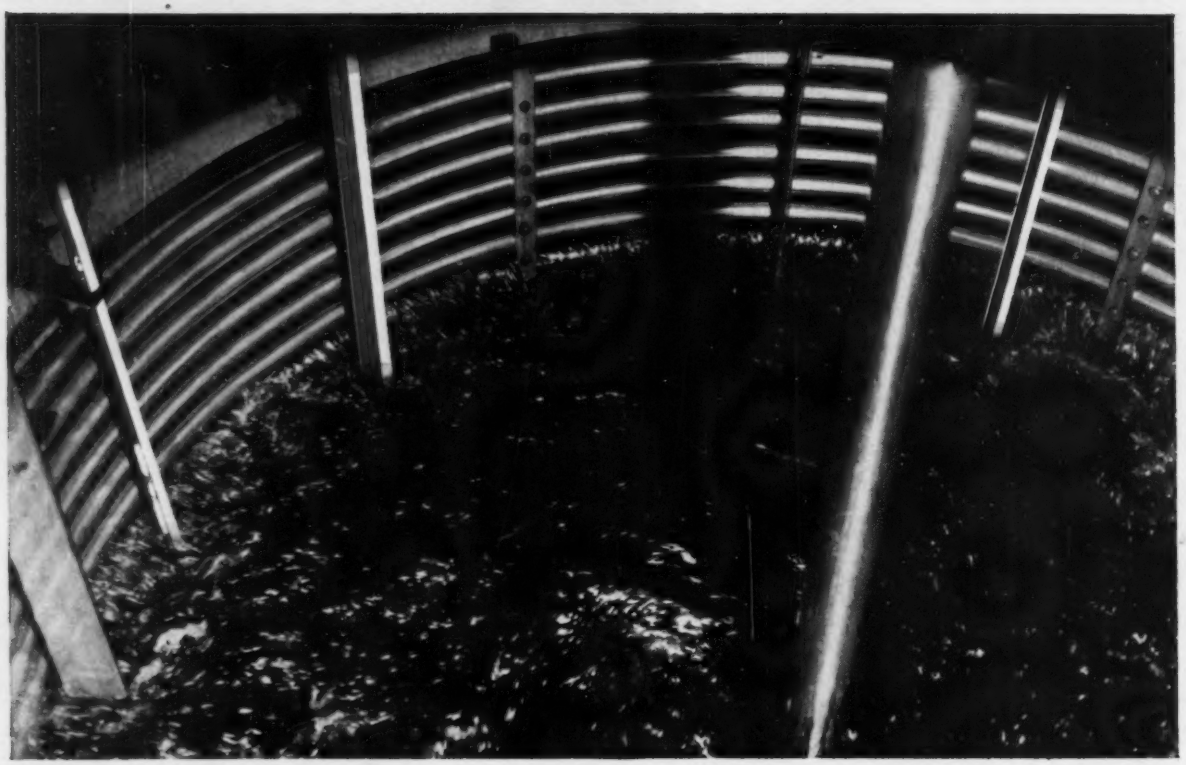
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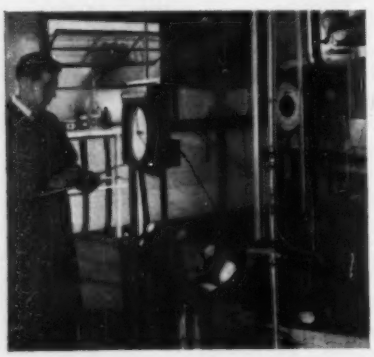
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Technology
Newsletter

CHEMICAL WEEK
July 22, 1961

Direct conversion of fission energy into electricity—with no heat cycle at all—is the goal of a research program under way at Battelle Memorial Institute (under contract for Pratt & Whitney Aircraft).

Initial criticality for the experiment has been achieved in a specially built polyethylene-moderated reactor. The core of the reactor is a void into which two concentric cylinders are placed. The outer one consists of a 4-in. aluminum pipe; the inner one a ½-in. pipe of molybdenum coated with uranium. When the reactor goes critical the uranium on the inner pipe breaks into two large fragments that contain 84% of the fission energy. These collect on the aluminum (anode), building up voltages as high as several million volts. Subsequent positive charges hitting the anode must work against this field; thus, their kinetic energy is transformed into electricity.

The idea has been thought of before. One difficulty is that secondary electrons are produced too, serve to offset the positively charged fragments collecting on the aluminum. Battelle researchers are attempting to circumvent this by a negatively charged wire grid inserted between the two pipes to screen out the secondary electrons.

The concept, Battelle reveals, has been under study since '58, and many in-pile experiments have been conducted in its research reactor. Work requiring high radiation levels will be continued there while work calling for unique combinations of radiation, high vacuum and special arrangement of equipment will be carried out in the new plastic reactor.

•

Catalyst news on widely separated fronts:

• Houdry Process Corp. has proved a pet theory to its own satisfaction: the presence of a halide is not necessary in a platinum reforming catalyst. Normally, halide is introduced as a base-addition or as a platinum salt containing a halide. Houdry has introduced a halide-free catalyst that is giving satisfactory performance in Houdriforming units in Japan and can be readily regenerated in place.

• American Cyanamid and Walker Manufacturing (Racine, Wis.) plan jointly to submit a smog-controlling, catalyst-muffler combination to the California Motor Vehicle Pollution Control Board. The two firms, working independently on the problem for several years, joined forces last year to bring together Cyanamid's know-how on catalysts, Walker's experience in providing exhaust systems and other automotive products.

•

The Air Force is spending big for basic research. The Air Force Office of Scientific Research, one of the four basic research organizations of the service's Office of Aerospace Research, awarded grants and contracts totalling $21.5 million for the fiscal year ending June 30.

Technology Newsletter

(Continued)

All its awards go toward unsolicited proposals, are evaluated on the basis of originality, significance to science, relevance to Air Force needs, and competence of the investigator.

•

M.I.T. researchers have produced a continuous magnetic field of over 126,000 gauss, probably the most powerful ever produced on a continuous basis. (Normally, magnetic fields stronger than this are achieved in pulses of only a few-millionths of a second.) Key to the magnet is a special solenoid developed by Henry H. Kolm. The development is expected to be useful in fundamental studies of semiconductors and superconductivity; also in fusion studies.

High Voltage Engineering built the core, which is grapefruit size. It consists of a long, slotted copper ribbon rolled up jellyroll fashion. Water is forced through the slot to remove the tremendous quantities of heat evolved. The 126,000 gauss test exhausted available power at the lab; the ultimate capability of the magnet is still unknown.

•

Now polysulfide rubber can be made in a spongy, resilient grade that can be colored. Secret: a curing system utilizing sodium carbonate peroxide. Thiokol, developer of the material, is introducing it in a two-package formulation—typically an epoxy, the curing agent and pigment-containing solvent in one part, a Thiokol liquid polysulfide in the other.

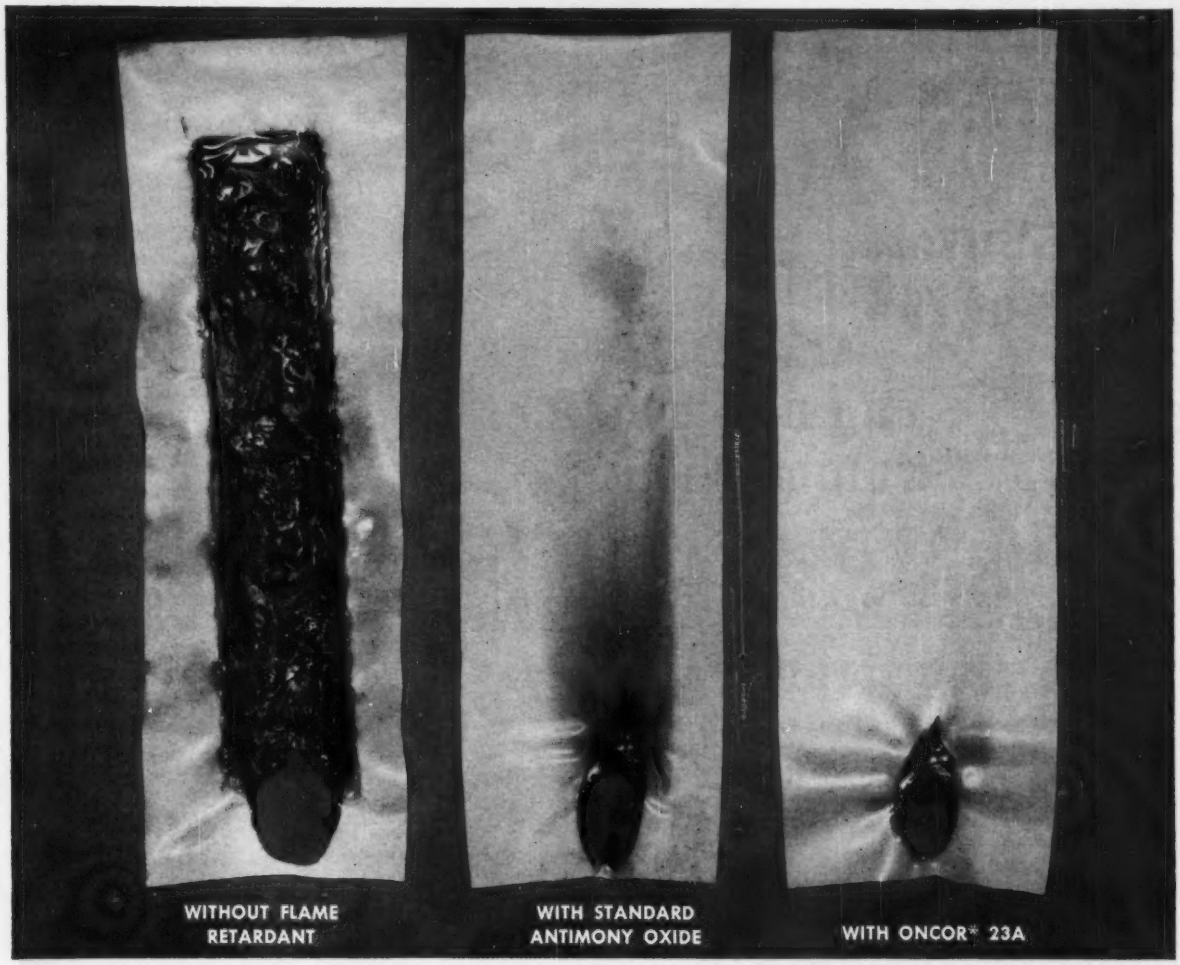
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Ion engines are getting a big push. The National Aeronautics and Space Administration has given Radio Corp. of America a contract to build seven capsules to flight-test ion engines, beginning in '62. Each capsule will cost about $200,000; four will be used for ballistics tests, three for ground tests. First engines to be tested will be cesium-fueled versions being developed by Hughes Research Laboratory, and mercury-fueled models under development by NASA's Lewis Research Center.

In all, five types of ion engines are being developed, four for NASA and one for the Air Force. Fourteen tests are programmed between '62 and '65 to increase gradually the size of the engines up to a 60-kilowatt model destined for interplanetary missions.

The basic idea in ion propulsion is to form the ions, then accelerate them by means such as passing them through a magnetic field. The ions exiting the nozzle would give the rocket its thrust in the same way that conventional propellants do.

Designed as upper staging power for space vehicles, ion propulsion theoretically could triple payload. But it will be two years before an ion engine is put into orbit. Seven ion flights are scheduled for '63; one or more is destined to orbit the earth.



Typical results of recent flammability tests on 6 mil PVC film, following ASTM Method D 1433-56T. Antimony oxide and ONCOR 23A used at 5% level (resin basis)

Tests show effectiveness of

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Write for Literature



CW PHOTO: JOAN SYDLOW

Scrubbing won't dull polishes based on new acid-soluble polymers.

New Soapproof Polymers Shine in Floor Polishes

New polish polymers resist water, soap, detergents, but are still easy to remove.

In the next few months the Simoniz Co. (Chicago) will begin marketing a radically different kind of liquid floor polish. To be introduced first as an industrial product, then as a consumer item, the new polish produces a shine that's resistant to repeated scrubbings with soaps or syndets. The resistance to ordinary detergents is such that Simoniz will include a special remover in the polish package.

The polish film's ability to stand up to soaps and synthetic detergents without losing its luster is due primarily to its alkali resistance. The polish can be completely and easily removed, however, by means of a mildly acid remover. In the past it has been possible to make polishes that would not be damaged by detergents but most of these were difficult to remove. By offering a polish that combines both alkali resistance and easy removability, Simoniz figures it is breaking new ground.*

The basic polymers—acrylic and styrene—on which the new polish is based are not new to the field, but they have been modified so that they can be put into acid emulsions.

Acid-soluble polymers may be made in several ways. One is use of amino-containing monomers—e.g., dimethylaminoethyl methacrylate, and tert-butyl aminoethyl methacrylate. Another route would be the use of non-conventional wetting agents in the polymer.

Race to a Finish: Virtually all of the U.S. companies (UBS Chemical, Rohm & Haas, Reichhold, Morton and Polyvinyl Chemicals) that furnish the 5 million gal./year of polymer emulsions used in floor polishes have been working on the idea of an acid-soluble (or acid-dispersible) polymer emulsion for some time. But, as reported (*CW Technology Newsletter, July 15*), Morton Chemicals (Chicago) and Polyvinyl Chemicals (Peabody, Mass.) appear to have gone further in commercializing such products than the others.

T. F. Washburn Co. (Chicago) also claims to have acid-soluble polymers suitable for polish use. This would appear to give Purex Co., which recently purchased Washburn, a captive source of raw material if it wants to push acid-soluble waxes through Franklin Research, (Philadelphia) another subsidiary, which is a major factor in the industrial polish field.

While polymer-makers Morton and Polyvinyl seem to have gained an advantage in getting their products out first, the victory must be market-proved. It's one thing to bring out a new kind of polish, another to sell it. The U.S. housewife (top sales target for the new polishes) may not buy the idea of a two-part system (polish and remover) even if it has demonstrable advantages over the products

* For a complete picture of who's who in the U.S. floor polish field, what products they make and what raw materials they use, *see CW, June 13, '59, p. 117.*

that are currently being marketed.

What goes on: Polyvinyl calls its polymer, a modified acrylic, by the tradenames Neocryl A-400 (acid dispersible) and Neocryl A-410 (acid soluble), supplies them as a 40%-solids, light-translucent liquid that weighs about 8.8 lbs./gal. Particle size is 0.02-0.04 microns.

Morton Chemicals (Chicago) has tradenamed its emulsion, also an acrylic type, Lock & Key Latex. Its physical properties are almost identical with those of the Polyvinyl product except that it appears to be somewhat more viscous. Both companies' polymers are compatible with existing standard-type polish formulations.

Since the Morton and Polyvinyl products are so much alike, a liquid polish formulation using either of them would probably be roughly 85 parts polymer emulsion, five to ten parts wax emulsion, five to ten parts alkali-soluble resin solution, two parts tributoxyethyl phosphate and one part fluorocarbon (to improve leveling). Polyethylene latexes such as Semet Solvay's and Spencer's will also work in new polishes.

For a more buffable polish, the polymer emulsion portion would be cut down to 55-65 parts and the wax emulsion increased to 25-35 parts.

Apparently the alkali-soluble resins (such as Shanco 334, and Durez 19788 and Schenectady SR-83) used as leveling agents and gloss improvers don't greatly hinder the acid-solubility of the finished polish. On the theory that there might be a market for acid-soluble leveling agents, however, Polyvinyl has worked out some resin types that can be used, and is seeking to patent them.

Removers: To remove a polish film of the new resins, without damaging the flooring, a mildly acidic cleaner is required. Typical cleaner formulations for acid-dispersible polymers include such weak acids as phosphoric, lactic, tartaric or citric, in combination with wetting agents (e.g., Igepal CO730 or Duomeen O) and a water-miscible solvent—a glycol ether, for example. A liquid remover concentrate might consist of four parts solvent, one part acid, and two parts wetting agent, would be diluted about 20:1 for use.

For removal of an acid-soluble polymer-emulsion polish, a mild acid (five parts), plus a wetting agent (one part) are needed for the concentrate; dilution is similar to that required by removers of acid-dispersible polymers. Solid removers are also easily formulated.

Recoatability: In addition to the big selling point of the new polish formulation—i.e., "scrubbability" coupled with easy removability—there's another advantage claimed for polishes made with the new emulsion: a second polish coat can be put on immediately without damage to the undercoat. This makes for a higher gloss. Worn floors, which normally require several coats of conventional polish to gain even nominal gloss, can be brought to a very high gloss with only two coats of the new polish, according to makers of the polymers.

Cost Hurdle: The biggest hurdle the new polymers present to polish manufacturers is high cost. The Morton and Polyvinyl materials are about 38¢/lb. in tank-kar lots (40-41¢ in drums). That's a lot more than the 17-23¢/lb. that polish formulators are paying for the polystyrene and acrylic emulsions used in conventional polishes. Use of the new polymers would add 25¢/gal. to the manufacturers' cost of making a polish. An acrylic polish (15% solids) using now-available emulsion polymers (most of which are actually copolymers containing some polystyrene) has a finished formulated cost of 70-80¢/gal.; the new polymers would boost this to $1-$1.15/gal.

Industry First: First target for the new polishes will be the industrial market. After that, the major sales effort will be directed at the consumer market. Janitorial supply houses will be approached last. The first two are easier to sell a premium product to; janitorial houses don't start stocking a new item until they are requested to by customers.

At least one firm, Haag Laboratories (Chicago), will be offering acid-soluble formulations to the industrial field by fall. The company is a private label house—it sells polish to others, retails nothing under its own name.

If the pattern established over the last five years holds up, the new polymers will probably find three-quarters of their market in the consumer field, the rest in industrial products. Polymer emulsions have almost taken over the household market; wax-rich, buffable

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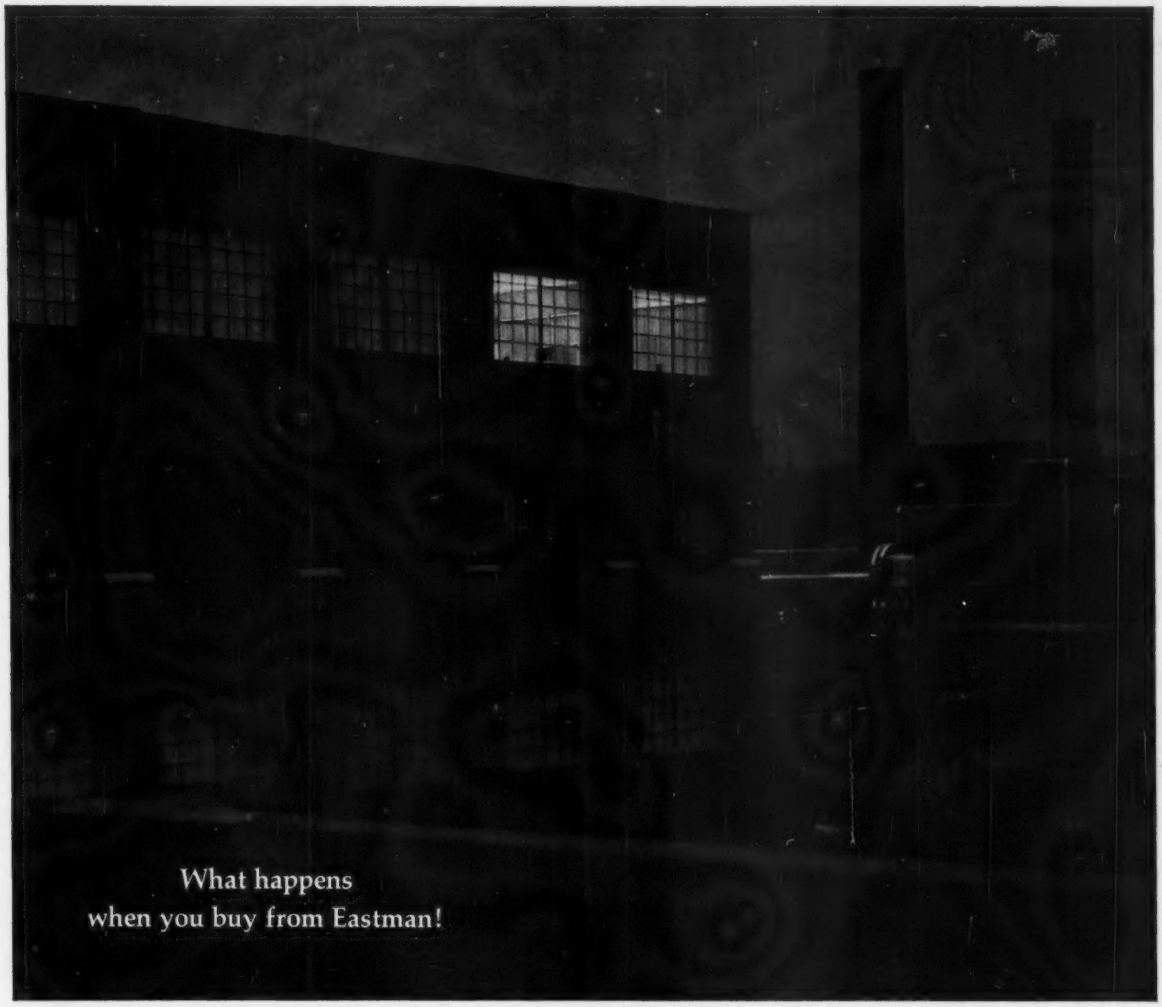
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For properties and shipping information on these and other Eastman products, see **Chemical Materials Catalog**, page 363, or **Chemical Week Buyers' Guide**, page 107.

Eastman



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"It was one of those ten of five Friday afternoon phone calls, so you might say I answered... well, guardedly.

"But it turned out to be a customer calling to say thanks for a service we had performed on the previous weekend. His acetone recovery unit had gone "sour," and he had called at about the same time a week past to ask if there was any possible way we could deliver 4,000 gallons of acetone before 8 o'clock Monday morning.

"To make a long story short, we did deliver. Of course it involved extra-schedule crews to clean and load a tank truck on Saturday morning, not to mention late Friday hours for some of the people in our order writing and traffic departments. But, as the customer pointed out while extolling our service at length and my part in it, our extra effort sure saved the day for them by keeping their process going.

"I was just beginning to get a smug, self-satisfied feeling when the customer said: 'Bob, you're not going to believe this, but....'

"He didn't have to say another word. The only thing that worried me was what to say to our production people after repeating to them: You're not going to believe this, but....

"Well all I *could* say was: Can you do it again? And they did. Same customer, same place, before 8 o'clock on Monday morning."

We sincerely hope that this *lightning-strikes-in-the-same-place-twice* situation never happens in your process operations.

But if it does, and you need service fast, give us a call.

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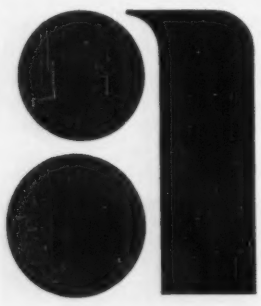
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SPECIFIC GRAVITY
Liquid—23.7°C/4° . . . 1.00
20°C/4° 92
Gas 0°C, 1 atmos . . . 1.74
BOILING POINT °C, 760 mm . . . —23.76
°F, 760 mm . . . —10.76
REFRACTIVE INDEX, n 20°/D
Liquid—23.7°C . . . 1.3712
Gas 25°C . . . 1.000703
SOLUBILITY (in cc.) of Methyl Chloride Gas in 100 cc. of solvent (20°C, 760 mm)
Water . . . 303
Benzene . . . 4723
Carbon Tetrachloride . . . 3756
Glacial Acetic Acid . . . 3679
Ethanol . . . 3740



ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN ● INDUSTRIAL CHEMICALS ● REFRIGERATION PRODUCTS ● FIRE FIGHTING EQUIPMENT

waxes still have a good share of the industrial field.

Not Just Polish: The new copolymers might have uses outside the floor polish field, say both Polyvinyl and Morton. Possible applications: in formulation of metal primers and coatings, paper coatings and saturants, paint vehicles, concrete paints and sealers, textile coatings, terrazzo and tile sealers, carpet and rug backings, acid-sensitive molding resins and films, adhesives, opacifiers, baking enamels, concrete reinforcing agents and antistatic agents.

Whether or not the polishes win a big market, the polymers on which they are based appear to have a promising future.

Auto Specialties Hassle

U.S. companies that market auto specialties—specifically brake fluids and antifreezes—are closely watching two concurrent Canadian developments that may have an effect on the companies future marketing of those products.

Canada's Restrictive Trade Practices Commission is now investigating an antifreeze distribution system that allegedly works to the disadvantage of national brands.

The commission believes that full-line, directed buying, and market access agreements could possibly limit competition in sale of service station products. A public inquiry will be held starting Sept. 11.

In Canada, 17 suppliers of antifreeze compete for a market estimated at 8.2 million gal. (U.S.). The country's major nationally advertised product is Union Carbide Corp.'s Prestone, but the bulk of the glycol antifreeze sells under private labels, such as those of the principal gasoline distributors (Esso, B-A, Shell, Texaco, etc.), automobile manufacturers (General Motors, Ford, etc.), automotive supply houses (Canadian Tire, Handy Andy, etc.), retailers (Eaton, Simpsons-Sears), and tire companies (e.g., Firestone). Several of the custom canners (Commercial Alcohols, British American Chemical, Consolidated Alcohol) also sell directly in their respective localities.

After a preliminary study, RTPC concluded that practically all of the 36,400 dealer stations in the big gasoline and petroleum products distributors' networks are tied to arrangements by which the dealers are required to take the distributors' full line of items. Many of the remaining stations appear to come under the influence of such directed-buying policies.

However, Union Carbide, as leading "independent," has made no representation to RTPC and has not yet said whether it will participate in the autumn inquiry.

Supplier's Spot: Carbide, in addition to canning Prestone, uses its facilities to can for the private labelers.

Dow Chemical, apparently content with its role as the major supplier of the antifreeze raw material, is not pressing for a change.

Dow's policy of selling to canners was revised in '56 to allow for direct contact with the major distributors. (In '55, it sold almost all its glycol to canners.) In '57, almost all of Dow's Canadian sales was custom-canned and Dow has become so strongly tied to private-label customers that it has publicly disavowed any intention of marketing its Dowgard in Canada.

Fluid Drive: The other recent development in auto specialties has been approval by the Ontario Dept. of Transport of a regulation that will require that fluids conform to SAE standards 70-R-1 and/or 70-R-3. This regulation is the result of efforts by the Automotive, Marine and Transportation Chemicals Division of Canadian Manufacturers of Chemical Specialties, a group headed by Lloyd Clifton of Hollingshead.

According to one Canadian source, the problem of defective brake fluids has become serious in Canada because some U.S. manufacturers, forced out of markets in 33 states in the U.S., have been dumping the material in Canada. The usual trade price for a heavy-duty brake fluid is about $23-25 for a 5-gal. container, for which the service man (labor included) charges 50-75¢/oz. The allegedly substandard material is sold to dealers for as low as $12-14/-5-gal. can.

The principal manufacturers of brake fluids in Canada include R. M. Hollingshead (Toronto), Bell Chemical, Union Carbide and Dow Chemical. Others include Wagner Electric, Superior Biochemicals, Tumbler Chemical (Toronto) and Asbestonos (Montreal).

what gives you THE GREATEST*...

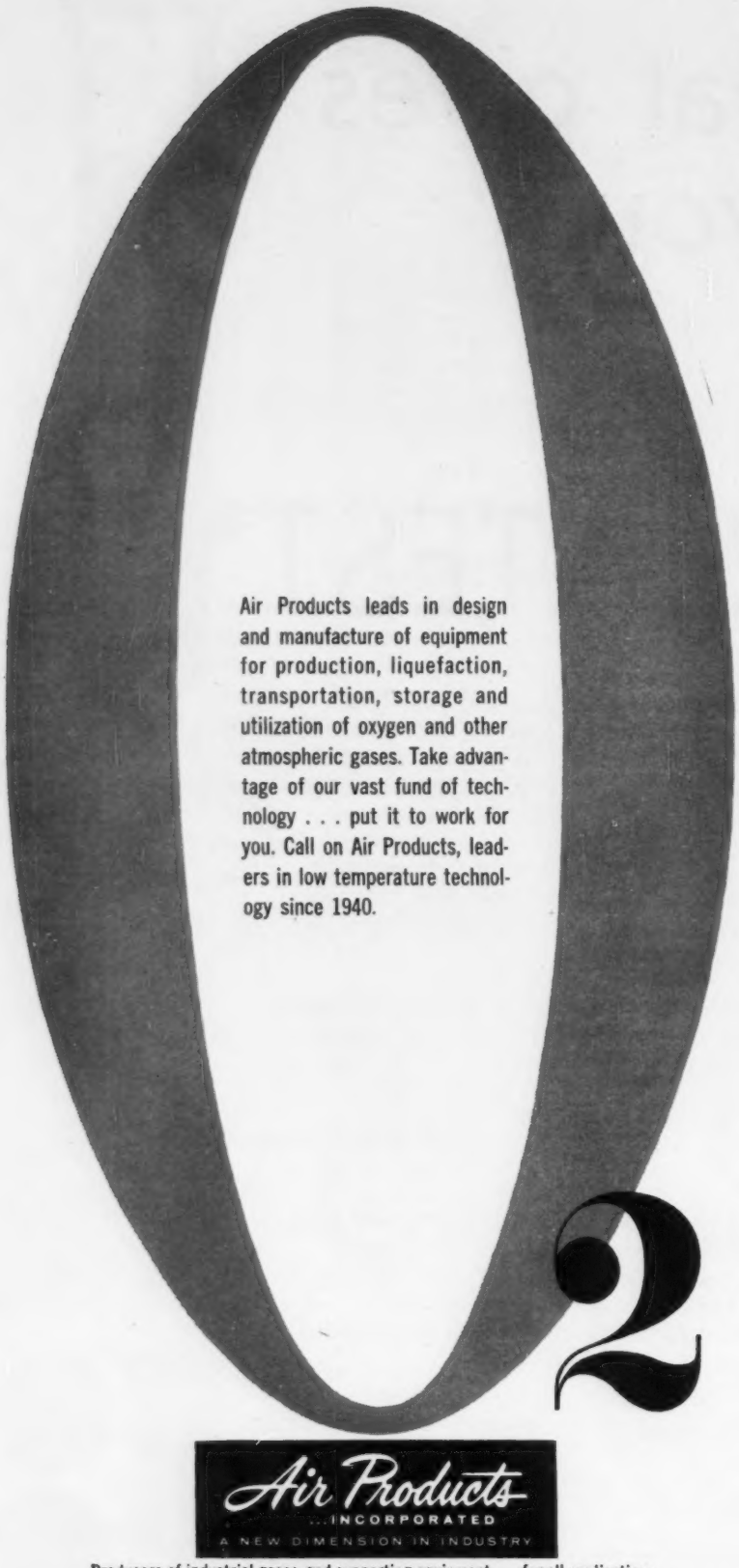
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What's more, advertisers will receive extra attention with bold-faced listings in the 35,000 copies of the Official CW-CE Directory to be distributed at the door. See your CW representative now for full facts . . . and then put together your best sales message for CHEMICAL WEEK's special "Chem Show Report." *Regular rates apply.* Closing date is October 28th.

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Pushbutton Drug Data

Aerosol suppliers watching the drug market can now get a better idea of the hurdles they face. A new report, prepared by the Packaging Institute, is based on responses from over half of the country's major pharmaceutical firms (names not disclosed) to a 10-page questionnaire about needs, plans, problems. It also shows that aerosol drug and pharmaceutical production is now about 14 million units/-year—17 times the output rate of eight years ago. Projections (by Du Pont) put the potential demand in '68 at about 33 million units.

The survey report (ASR-351) is available from the institute (342 Madison Ave., New York)—$2 for members, $4 for nonmembers.

Rain Repellant

A new aircraft rain "repellant" that's said to greatly simplify application to aircraft windshields is offered by Regal Air Corp. (New York). The product, designed to keep distortion-causing droplets from forming, was developed under a U.S. Navy Bureau of Aeronautics contract by Foster D. Snell (which owns the patents). It's sold in kits ($10)—liquid repellant, tissues for application and a cleaner. Each kit provides about 30 applications—first the window is washed, then a thin coat of the repellant is spread on.

The repellant, claimed to be effective at speeds up to 700 mph., can be used on glass or acrylic windshields. The company does not recommend the product for use in the automobile field at this time.

EXPANSION

Elbow Room: Raritan Plastics Corp. (Oakland, N.J.), custom extruder of heavy-gauge plastic sheet, has opened a new plant in Oakland. The new facilities cover about 25,000 sq. ft. on a 20-acre industrial plot.

•

Foreign Push: Bon Ami (New York) has engaged Overseas Management Services Inc. to operate its international division. The firm currently makes and markets its cake Bon Ami household cleaning agent in Australia, Canada and Mexico and has recently concluded manufacturing arrangements in Colombia and Italy.



Try a touch of Amber



If you bottle toiletries for men, we suggest you take a good look at amber glass.

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CYANAMID

Chemical Newsfront



ONE CYLINDER, TEN OR A TANK CAR? Name your need for the CN ion, and Cyanamid's Hydrogen Cyanide (HCN) can fill it in any quantity—and economically, too. Compared with the considerably higher cost of solid cyanides, HCN—with better than 98% of its weight consisting of the CN ion—will save you money and may well repay investment in bulk handling and storage facilities, too.
(Process Chemicals Department)



ELECTROLUMINESCENCE: TOMORROW'S LIGHT. The newest word for light is Cyanamid's CYANOCEL* chemically modified cellulose. A cyanoethylated, highly refined cellulose, CYANOCEL is the most efficient dielectric carrier for the filling in the "light sandwich" that makes possible lights without heat, glare or moving parts. In the future, it may be fabricated into walls, ceilings and even curtains to give a cool, uniform light. The picture above shows miniature furniture set up before 10 x 14" GE panel lamps.

*Trademark

(Petrochemicals Department)



UNLOCKING POLYMER INSOLUBILITY. Thanks to copolymerization with Cyanamid's N-t-Butylacrylamide (t-BAM), vinyl monomers (whose polymers are ordinarily incompatible with alcohol) can produce polymers which are alcohol soluble. Such resins containing t-BAM can be applied from alcohol solutions—even in spray-can formulations. t-BAM is available commercially as a free-flowing wet cake or as a dry powder. (Market Development Department)

WHITE BUTYL RUBBER—THANKS TO PRONAR. Cyanamid's new PRONAR* butyl rubber modifier is a highly-active, non-discoloring, low-cost modifier that makes possible the heat treatment of white and light-colored butyl. Possible applications: in white side walls, housewares, wire and cable. For the full PRONAR story, send for Cyanamid's booklet by checking the appropriate area on the coupon.

(Rubber Chemicals Department)

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- ☐ N-t-Butylacrylamide
- ☐ PRONAR butyl rubber modifier

Name_____

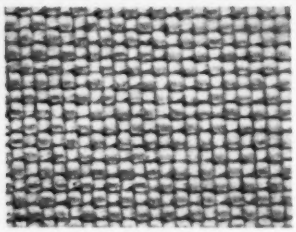
Company_____

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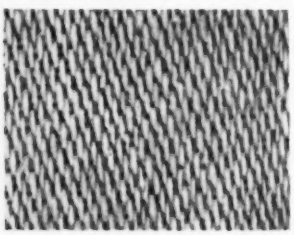
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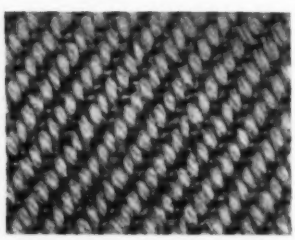
FILTER FABRIC QUIZ



1. This is a plain weave . . . TRUE ☐ FALSE ☐



2. This is a twill weave . . . . TRUE ☐ FALSE ☐



3. This is a satin weave . . . TRUE ☐ FALSE ☐

1. TRUE. You can always identify a plain weave by its simple "one up and one down" construction. It permits maximum yarn interlacings per square inch and, in a tight weave, affords high impermeability and covering qualities. Used in cottons and synthetics.

2. FALSE. This is a satin weave. With fewer interlacings, spaced widely and regularly, a satin weave has increased porosity, smooth surface and high cover factor. It is valuable in gaseous filtration, such as dust collection. In cotton, commonly known as sateen.

3. FALSE. This is a twill weave—distinguishable by the sharp diagonal line. In equivalent constructions, twills have fewer interlacings than plain weaves—and greater porosity. Filter twills woven of both cotton and synthetic fibers are widely used.

Weave is a very important consideration in the selection of a filter fabric, but many other factors help determine a fabric's performance—fiber, count and finish, for example. That's why you need the assistance of a specialist—like the specialists who distribute Wellington Sears filter fabrics. They're experts in the field—and always ready to lend a hand in helping solve your problems. For their names, and a free copy of our illustrated booklet, "Filter Fabric Facts," write Dept. M-7.

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High-Strength Vinegar By New Continuous Process

A commercially feasible system for concentration of high-strength vinegar by continuous methods has been developed. The process is said to reduce costs substantially over conventional batch methods. Although developed to meet requirements of the pickle industry, the system is adaptable to processing similar fluids in chemical, food, other industries.

In the new process, 170-grain feedstock — obtained by blending fresh 120-grain vinegar with a starter batch of 200-grain material — is upgraded to 200- or higher grain strength by slush freezing in a three-cylinder, ammonia-jacketed heat exchanger apparatus. Removal of the ice then concentrates the effluent from a centrifugal separator to 200-grain. Interchange features of the system are reported to reduce greatly both cooling tower requirements and heat load on the continuous process equipment.

CONTINUED

Coke Oven Aromatics

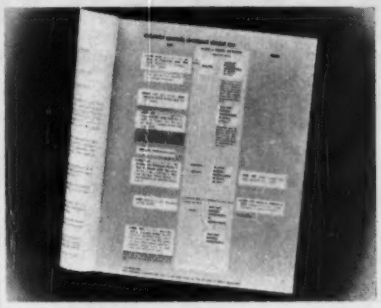
duce thiophene content from 1,000 to under 1 ppm at a cost of only 0.86¢/gal.

Low Capital Investment for Process

Biggest plus for the metallic sodium desulfurization systems is the low capital investment required. Capital outlay for a 5,000 gal./day BTX unit would be about $350,000 — far less than for a hydrodealkylation system of the same capacity.

Typical cost figures for naphthalene desulfurization are: 10 million lb./yr. — 0.57¢/lb.; investment $50,000: 50 million lb./yr. — 0.43¢/lb.; investment $100,000.

"These processes allow producers of light oil and naphthalene to market low sulfur products, hold their customers and remain competitive. Coke oven producers still have an opportunity to provide their customers with good quality material. Otherwise," concluded Mr. Faye, "these customers will surely go to the petroleum-based material at the same price."



Form-filing instruction page from new Government Regulations Supplement to U.S.I.'s Ethyl Alcohol Catalog is typical of simplified information contained in booklet. Supplement makes latest alcohol regulations easy to understand; makes forms easy to handle. For copy, address Technical Literature Dept., U.S.I. Chemical News, 99 Park Ave., N.Y. 16, N.Y.

CONTINUED

Aerosols

place, claimed 11% of total production.

In the Cologne and Perfume category, the number of units produced in the "one ounce and under" size almost doubled from 1959 to 1960. The small units now account for 29% of the total category, as compared to 17% in 1959.

NONFOOD AEROSOLS REPORTED IN 1960 COMPARED TO 1959

(figures in millions of units)

Product	1960	1959
Hair Sprays	111.9	79.7
Shaving Lather	68.2	72.6
Insect Sprays	67.5	65.9
Coatings	67.2	52.6
Room Deodorants	66.8	59.7
Waxes and Polishes	40.2	11.8
Colognes & Perfumes	39.0	34.1
Household Products Other than Room Deodorants, Waxes and Polishes	69.8	65.8
Personal Products Other than Hair Sprays, Shaves, Colognes & Perfumes	24.6	33.5
Miscellaneous	51.8	22.6
TOTALS	607.0	498.3

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

New peptide-former, N-ethyl-5-phenylisoxazolium-3'-sulfonate, now available in developmental quantities for physiological and enzyme studies. Said to give 80-95% yields of very pure peptides by simple, fast procedure. **No. 1730**

Custom blow molding, pressure and vacuum forming facilities for making plastic parts described in new brochure. Blow moldings with capacities up to 5 gallons can be made. Preprinting for vacuum forming claimed a specialty. **No. 1731**

Three "Fluorescent labeling powders" now on market said to tag proteins in seconds. Technique is designed for labeling antibodies with dimethylaminonaphthalenesulfonyl chloride, fluorescein-isothiocyanate, lissamine rhodamine. **No. 1732**

A do-it-yourself, special-purpose slide rule kit now obtainable permits individuals to design and construct their own special-purpose slide rules for recurring calculations in their work. Explanatory booklet included. **No. 1733**

New adhesive is claimed particularly useful for bonding polyethylene film to itself or to paper. Said to permit use of paper labels on polyethylene bottles, etc. Is a natural rubber based, water emulsion. **No. 1734**

New gas scrubber uses principle of logarithmic curve flow, said to provide high efficiency at low cost. Counter-flow of water and gas over volute curves is reported to produce scrubbing vortex for most effective separation of dust. **No. 1735**

New antimicrobial assay kit tests for presence of bactericides, fungicides, antibiotics. Kit consists of impregnated paper disks in small plastic chamber. Permits rapid laboratory screening and field control tests. **No. 1736**

Tenth edition of Handbook of Chemistry now being sold. Many of detailed tables of specific properties have been completely rewritten. Provides new material on properties of plastics as materials of construction. **No. 1737**

Glyoxylic acid — 40% now available in commercial quantities. Claimed unique because of its acid-aldehyde function. Suggested as intermediate in making drugs, cosmetics, artificial colorings, synthetic resins. **No. 1738**

Special edible ink has been developed for printing trade marks on wax-coated pills. Contains cyclohexane and ammonia said to penetrate wax and do excellent printing job. Ink is patented. **No. 1739**

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Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Intermediates.

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U.S.I. CHEMICAL NEWS

July ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1961

Nonfood Aerosol Production Up 17% in 1960

An estimated 670 million nonfood aerosol units were produced in the U.S. and Canada in 1960 according to the Chemical Specialties Manufacturers Association. This is an increase of 17% over the 1959 estimate of 575 million units.

The largest seller is still the hair spray — way out in front in 1960, with 18% of all aerosols produced falling in this category. Shaving lathers, again in second

MORE

New Large Tank, Molded of Powdered Polyethylene, Resists Chemicals, Foods

A new, thick-walled, extra-large polyethylene container which provides dependable, economical storage for as much as a ton of liquid or bulk product, is currently being introduced for use in meat packing and processing plants.

The new tank combines strength and light weight with unusual resistance to meat and food juices, chemicals, acids and alkali solutions. It is virtually unaffected by temperature variations, and has smooth, clean, seam-free construction.

The container, one of the first results of a new polyethylene processing technique called powder molding, is made from U.S.I.'s MICROTHENE® finely divided polyethylene resin. By hot-mold processing the MICROTHENE, the fabricator has been able to produce a tank considerably larger than those produceable by competitive processes, without sacrificing quality. The large size and excellent properties of polyethylene tanks molded in this manner suggest many possible uses in the CPI.

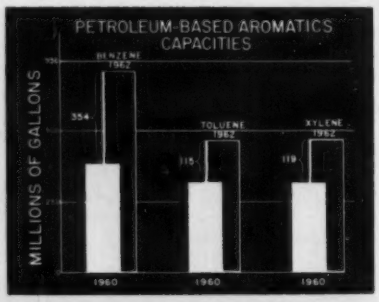


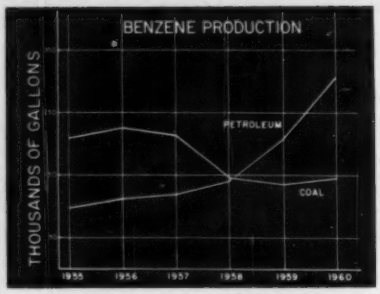
Large tank, molded from polyethylene powder, is strong, lightweight, resistant to chemicals.

Coke Oven Producers Advised to Meet Competitors' Quality or Lose BTX-Naphthalene Markets

Inexpensive Sodium Desulfurization Process Suggested as Solution to Quality Problem

Petroleum companies and chemical manufacturers are threatening to take the aromatic chemicals market away from the coke oven producers. The only chance for survival, according to Martin Faye of U.S.I., is to market material of a quality comparable to that of petroleum-derived BTX and naphthalene. The warning was sounded at the American Coke and Coal Chemicals Institute Eastern Regional Meeting at Rye, New York.





Mr. Faye pointed out that 1965 market estimates for benzene consumption are put at 800 million gallons — about 350 million above today's demand. To meet this, petroleum companies have 390 million gallons of capacity planned for completion before the end of 1962. Petroleum companies could then supply over 750 million of the expected 800 million gallon market.

Naphthalene is slated to follow the same path, according to Mr. Faye. While coke oven naphthalene capacity will hold steady at 642 million pounds, petroleum naphthalene's present capacity of 100 million pounds will jump to 450 million by the end of next year.

Low Thiophene Content Important

Key to holding the aromatics market, Mr. Faye told the coke oven producers, is product quality. Petroleum benzene, for example, has a thiophene content of less than 1 ppm. Coke oven benzene generally has a thiophene content of 250 to 1,000 ppm. "Only a few coke oven plants, seeing the handwriting on the wall, have girded themselves for competition by installing processes that remove paraffins and thiophene," said Mr. Faye.

Mr. Faye outlined two relatively simple processes for thiophene removal which use metallic sodium. These processes are said to be particularly attractive to small and medium size producers. The first, a mechanically agitated system, feeds vaporized aromatics through a blender-reactor containing high surface sodium on an inert carrier. Direct operating costs for this process are about 1.55¢/gal. For plants with capacities over 10,000 gal. per day of light oil, Mr. Faye recommended a fluidized solids system which can re-

MORE

Methionine Reverses Effect of Thyroid Hormone As Metabolic Uncoupler

Recent investigations on the metabolic role of the amino acid methionine indicate that it has functions other than that of raw material for protein formation. It has been found that while iodocasein — a dietary source of thyroid hormone — increases oxygen consumption, reduces growth and feed efficiency, and enlarges the liver in experimental chicks, adding methionine to the diet will reverse all of these effects.

Since thyroid hormone is a metabolic uncoupler, the study suggests that methionine acts in metabolism as a coupling agent, or by enhancing biosynthesis of such an agent, or by otherwise interfering with the action of the thyroid hormone as an uncoupler.

Market Newsletter

CHEMICAL WEEK
July 22, 1961

Anticipated price reductions on sodium borohydride (*CW June 10, p. 63*) became fact last week when Metal Hydrides Inc. (Beverly, Mass.) posted slashes of up to 60%. Carload quantities (35,000 lbs.) of high-purity amorphous powder dropped to $8/lb. from $20/lb. A stabilized water solution (SWS) of borohydride dropped from $15/lb. to $7.50/lb. in tank cars (11,000 lbs.).

These quotes, however, are now somewhat academic: there are no markets for such bulk orders. The low prices are posted in the hope that bigger-volume uses can be stimulated by next year.

More nearly reflecting the interests of current buyers is the $11.75/lb. tab for 55-gal. drums of amorphous powder in lots of 5-10,000 lbs.

Threatened competition in U.S. borohydride markets by Farbenfabriken Bayer AG.—which recently put a low-cost process into commercial operation (*CW, June 10, p. 63*)—was a significant factor prompting MHI's price cuts. Bayer's prices were general knowledge in this country and MHI customers had been pressuring for lower prices here; hence MHI's reductions were posted at this time rather than later in the year as originally planned.

Meanwhile capacity is rising. MHI is pushing completion of its new borohydride plant at Danvers, Mass. (capacity: more than 2 million lbs./year). It expects to have it completed in late September or early October. The firm's plant at Beverly, Mass., has a capacity of 30-35,000 lbs./year.

Callery Chemical Co.'s 1-million-lbs./year borohydride potential boosts total U.S. capacity to more than 3 million lbs./year—whereas the world market is estimated at only 25,000 lbs. this year.

Will Callery Chemical meet Metal Hydrides' prices on sodium borohydride? Callery's President E. G. Sanner says "when and if" carload quantities of borohydride are in demand, Callery will be "fully competitive." But Sanner agrees that the bulk quotes are "purely hypothetical" now because current demand for the chemical is so low. Meanwhile, because the market is not fully developed, Callery will be content to offer ton lots "at the lowest possible prices."

•

Production of monochloroacetic acid is at a standstill in Canada. A tip-off to that effect, by Canada's Dept. of National Revenue, was confirmed when Shawinigan Chemicals reported its 4-million-lbs./year plant, at Shawinigan Falls, Que., is now in mothballs.

Shawinigan lost out to European producers in bids to supply two new 2,4-D plants in western Canada—Naugatuck's plant at Edmon-

Market Newsletter

(Continued)

ton (now in operation) and Interprovincial Co-op (onstream this fall). Interprovincial indicates it will ultimately make its own MCA.

Shawinigan says it is shipping supplies to the U.S. until its inventories are depleted.

Pechiney has been hitting world markets with high-purity monochloroacetic acid made from trichloroethylene—and has been offering it at 5-6¢/lb. below list prices posted by Shawinigan, Dow and Hercules.

Hoechst, ACNA (Italy) and Stork (Netherlands) are also active, and some observers figure that this year the four firms will probably supply almost half of the 80-million-lbs. monochloroacetic acid market in North America.

•

Likelihood of a price increase on zinc dust is averted—or at least delayed—by American Smelting & Refining's switch to a cheaper raw material.

Formerly, zinc dust was recovered from hot-dip galvanizing dross; but such galvanizing became outmoded and supplies of waste zinc were petering out. AS&R turned to costlier prime Western zinc, which increased chances of higher zinc dust prices.

Now AS&R claims it has licked the problem of making zinc dust from scrap die-castings (containing troublesome alloyed metals), says the need for a major price hike is less pressing. The firm also reports it has doubled capacity of its Trenton, N.J., plant. Some uses of zinc dust: reducing agent, catalysts, corrosion-resistant paints, undercoatings.

•

The pressure of stiffening competition in world textile markets has European producers squirming. Reactions run from price cutting to production curtailments and to planned switches to other products.

Imperial Chemical Industries, for example, is trimming prices of Terylene polyester staple (tow and top) by 10¢/lb., to about $1.28/lb. for most popular varieties. Reductions, "in line with world trends," cover export as well as domestic prices.

Zellwolle Lenzing, Austria's dominant producer of rayon staple fibers and pulp-cellulose, cut output and laid off 400 of its 3,000 employees. Sales drops are blamed on world competitive conditions brought on by overcapacity in Japan and the U.S. Hints by Zellwolle management suggest possible switches to other areas of synthetic fiber production.

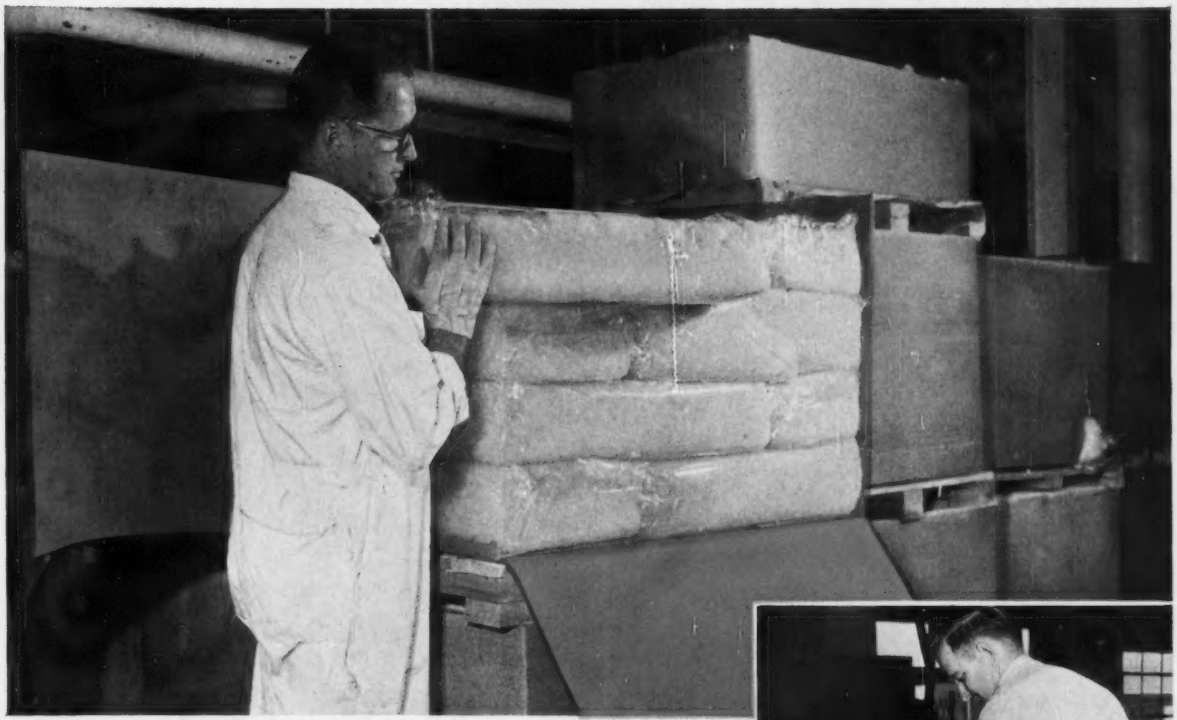
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Two firms are starting up Canada's pentachlorophenol industry. Dow Chemical at Fort Saskatchewan, Alta., and Naugatuck Chemicals (Division of Dominion Rubber) at Edmonton, Alta., will make the wood preservative.

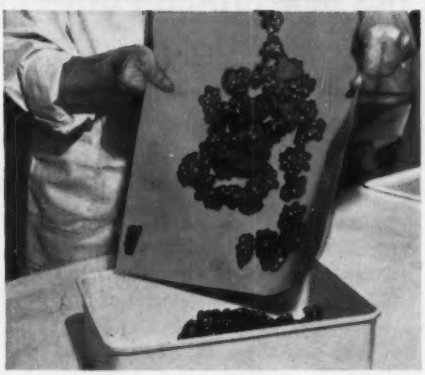
Other products to be made in new or expanded plants: phenol (Ladner, B.C.), ethanolamines and glycols (Fort Saskatchewan) by Dow; dichlorophenol (Edmonton) by Naugatuck.

SILICONE NEWS from Dow Corning

Silicones lighten the load







Prevent sticking, cut costs with Syl-off paper coatings

Syl-off® silicone coatings on paper and paperboard make it easier to unpack sticky products . . . simplify and speed handling. Even such tough stickers as raw rubber, asphalt, adhesives and plastic bases come away cleanly and quickly from all types of containers and process papers coated with Syl-off. Nonmigrating and noncontaminating, these anti-adhesive silicone coatings help processors remove all of the product . . . cutting waste to the bone . . . minimizing unloading time.

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For Information about properties and applications of Syl-off . . . and for a list of sources for paper products with Syl-off coatings, contact the Dow Corning office nearest you. Address Dept. 2819.

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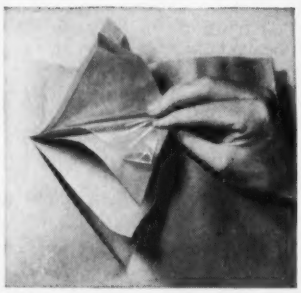
"This new CHASE POLY-PLY multiwall bag is a real Problem Solver"

Says Lee Schram, Multiwall Bag Buyer, Morton Salt Company

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Bumper Insect Crop Boosts Insecticide Sales



WIDE WORLD

Although the agricultural season is just getting under way in many parts of the country, there is already good evidence that insecticide makers are heading for a record year in '61. Bolstering this forecast: a bumper crop of insects and a growing appreciation by farmers of the crop-insurance value of insecticides.

This year insecticide demand should climb to about $130 million (*see graph, left*)—a 7% gain over '60s total of $121 million and the first significant gain in two years. Domestic insecticide demand actually declined in '60, according to the National Agricultural Chemicals Assn.; export demand kept sales up to the '59 level.

But insect infestation is reaching serious proportions in various parts of the country and insecticide sales have been brisk so far this year. In the northern plains states (*photo*) grasshopper damage is posing the country's most dramatic insect problem.

The government is aiding farmers in this area. According to the USDA, more than 500,000 acres of Montana range alone have been treated, with the government footing one-third of the bill. Almost all North Dakota counties have appealed for federal aid to combat the grasshopper infestation. A combination of grasshoppers and drought, in the opinion of many, have created North Dakota's most severe crop problem since the '30s.

Serious grasshopper outbreaks are also reported in South Dakota and the grasshopper population is building up in southeastern Colorado. Grasshopper controls are now being applied in Washington.

But the grasshopper is only one of several species of insects causing concern to farmers. Earlier this year a widespread outbreak of green bugs fattened insecticide sales in the small-grains region of the south central part of the U.S.

In addition early outbreaks of cotton pests have been reported. Less-than-ideal weather has adversely affected insecticide application in the cotton belt so far this year. Nevertheless, a good cotton insecticide year is expected, partly due to a

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U.S. Insecticide Production
(thousand dollars)

	'57	'58	'59	'60
Hexachlorocyclohexane	5,538	4,619	4,136	6,740
DDT	26,154	26,159	31,348	29,445
Other chlorinated insecticides	50,198	61,738	59,595	59,786
Methyl parathion	2,118	5,198	4,610	9,080
Parathion	6,667	5,765	6,701	5,288
All others	2,420	7,068	10,407	15,111
Totals	93,095	110,547	116,803	125,450

heavy infestation of boll weevils.

Other insects are causing trouble elsewhere—the European corn borer in Delaware, Maryland and Illinois; the corn earworm and fall armyworm in Kansas; the chinch bug in Missouri; webworms in Missouri, Kansas, North Dakota and Colorado.

Some insecticide producers are counseling caution. "It's still too early to tell," says one company spokesman. "Unpredictable factors such as weather could hurt demand." But most U.S. producers express optimism. Niagara Chemical's Stuart Bear feels that insecticide demand in '61 will hit an all-time high. Most other producers —e.g., American Cyanamid, Carbide, Monsanto, among others — report sales going well, expect '61 to be a banner insecticide year.

Matter of Appreciation: Farmers' growing appreciation of chemicals' ability to kill bugs and thus increase quality and quantity of crop production is boosting sales. For years, universities, government agencies and producing companies all have been actively teaching farmers the importance and proper use of insecticides. These educational programs are paying off. Today's farmers generally are quick to apply insecticides before serious crop damage occurs.

Changing Mix: And the rapid rate of new-product introduction testifies to the development of increasingly effective insect killers. These new and more potent materials are making inroads into the markets of established insecticides such as DDT and BHC (hexachlorocyclohexane). This is particularly true in cases in which insect resistances to these older materials is a growing problem.

Most of these newer products are included in the miscellaneous category (*table above*), which shows production of $15 million (manufacturers' level) in '60—a six-fold increase over '57's level of $2.4 million. Meanwhile, DDT output advanced only $3 million, approximately 12%, reflecting increases in exports, and BHC output grew only about $1 million since '57, while the newer methyl parathion moved up 400%, or $6 million, in production value.

DDT exports still bulk large in U.S. insecticide revenues. In '60, about 99 million lbs., valued at $30 million, were exported. Most of this material went into malaria eradication programs throughout the world (*CW, Feb. 11, p. 63*). Although these projects are nearing completion in several countries (e.g., India), exports are expected to continue strong for the remainder of this year.

Education Needed: The outlook is bright. Insecticide demand this year gives every appearance of establishing a new high. And the farmers' growing recognition of the importance of insecticides should continue to boost insecticide demand over the long pull.

But manufacturers of insecticides still have a long way to go in educating farmers to use their products at optimum level—to foster maximum crop production at minimum incremental cost. Strides are being made in this direction and progress is evident.

At the same time, new-product

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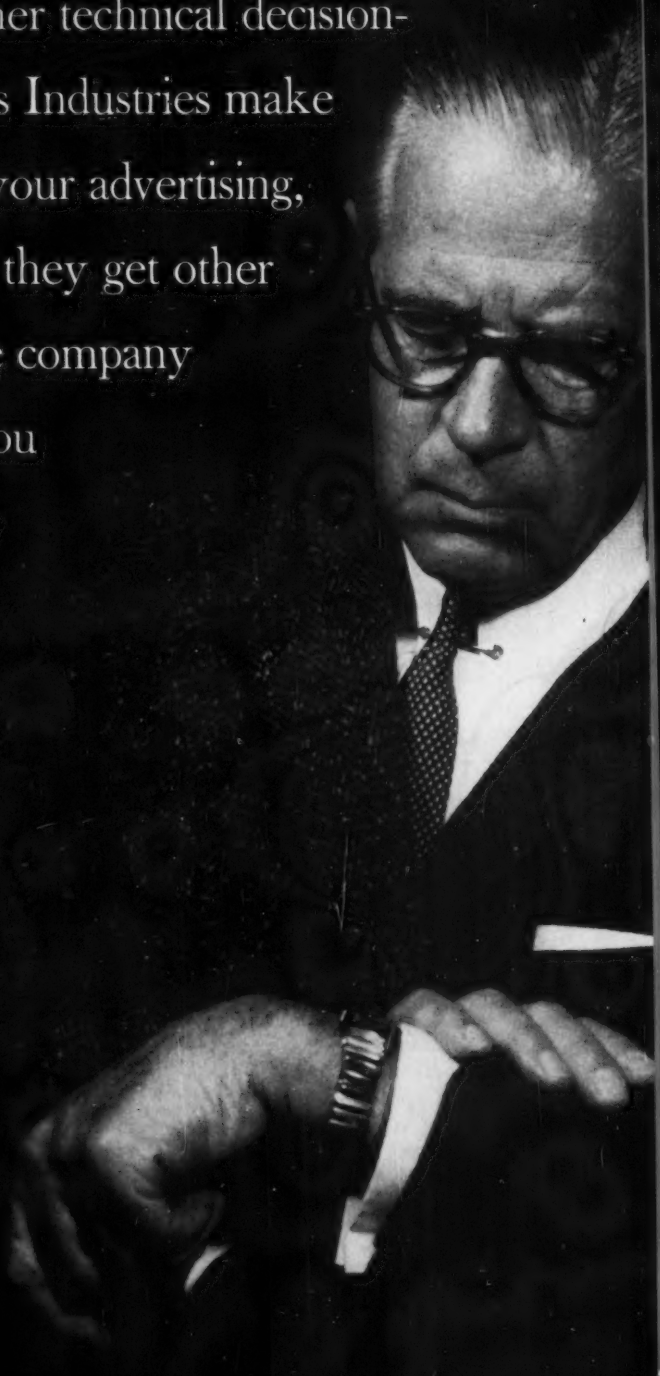
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introduction is expected to continue at a fast pace. Insecticide manufacturers recognize the importance of new and improved products to their sales, and research is at an all-time high.

MARKETPLACE

Tires: Tire manufacturing should hit a new high in '62, according to R. C. Firestone, president of the Firestone Tire & Rubber Co. He expects replacement passenger tire shipments to reach 71 million in '61, a 2.5 million gain over '60's 68.5 million. Reaching this target will require a sizable pickup during the latter part of this year. In addition, Firestone predicts a sharp increase in automobile and truck production next year, which should further boost tire sales.

•

Phosphate Rock: U.S. phosphate rock production showed a 10% tonnage increase in '60, according to producers' reports to Bureau of Mines, U.S. Dept. of Interior. Apparent consumption continued to rise and was about 4% above '59's total, while captive use by producers rose 7% and set a new record.

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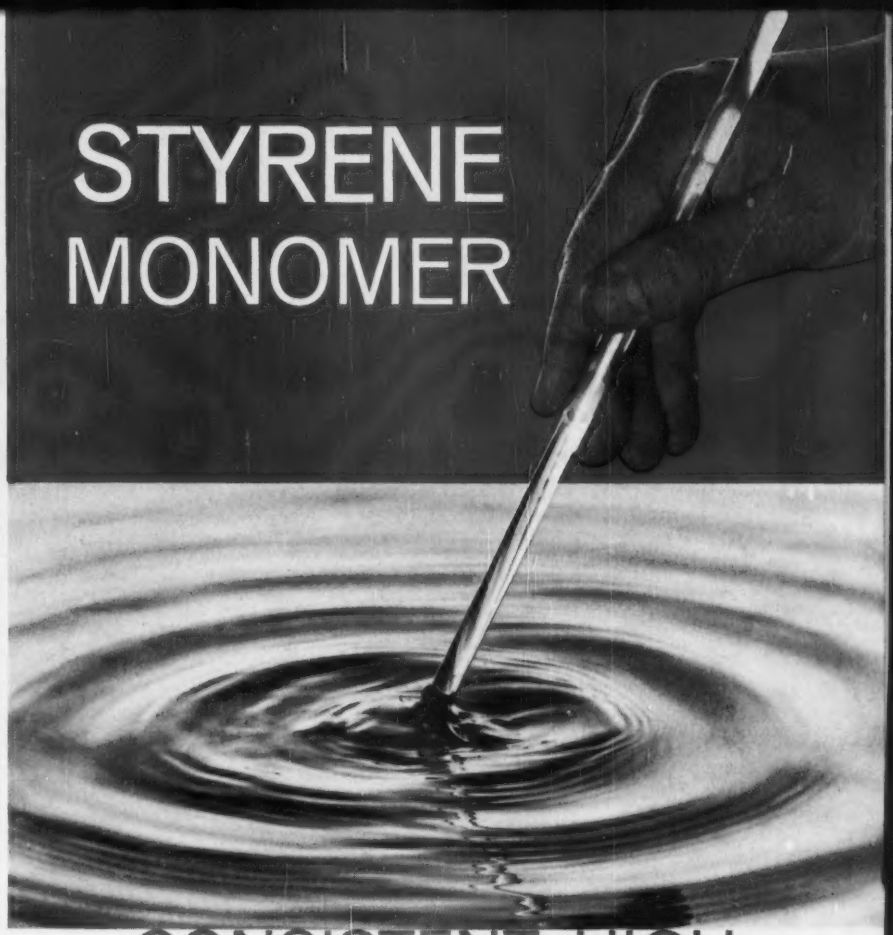
Surface-Active Agents: According to U.S. Tariff Commission's just-released report, production of surface-active agents amounted to 1.527 billion lbs. in '60, a 1.5% advance over '59's level of 1.504 billion lbs. The anionics continue to represent the lion's share of output: 1.072 billion lbs. in '60, or 70% of the total.

•

Plastics and Resins: In '60, plastics and resin production was 6.140 billion lbs., compared with '59's total of 5.865 billion lbs., according to the Tariff Commission. Polyethylene output: 1.337 billion lbs.; 1.203 billion lbs. of vinyl and vinyl copolymer resins were produced.

•

Silver: A silver shortage is a distinct possibility by '62. A sudden sharp rise in the price of silver will be the first consequence. During the past decade, world consumption has consistently exceeded mine production at a rate of 67 million oz./year. The difference between consumption and production has been made up by Treasury reserves. But now these are virtually used up.



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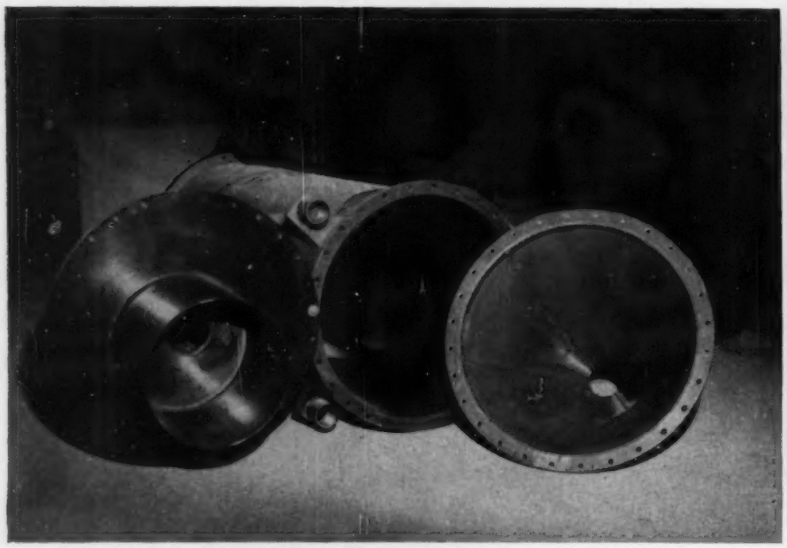
Today there is a qualified tank liner in your area, experienced with Penton, and able to employ it to meet your specifications. Because Penton resists more than 300 common reagents, at temperatures far in excess of those possible with most conventional lining materials, it can offer you important savings in original cost, maintenance, and in many instances permit higher processing temperatures for increased yields.

Want more information on Penton tank linings? Write for your copies of "The ABC's of Penton for Corrosion Resistance," and "The Penton Buyer's Guide," which includes a complete listing of Penton tank liners, and producers of other types of Penton processing equipment.

Cellulose Products Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, Wilmington 99, Delaware

CP61-1

Penton sheet used in fabricating tank linings illustrated on these pages manufactured by Garlock, Inc., Camden, N. J.

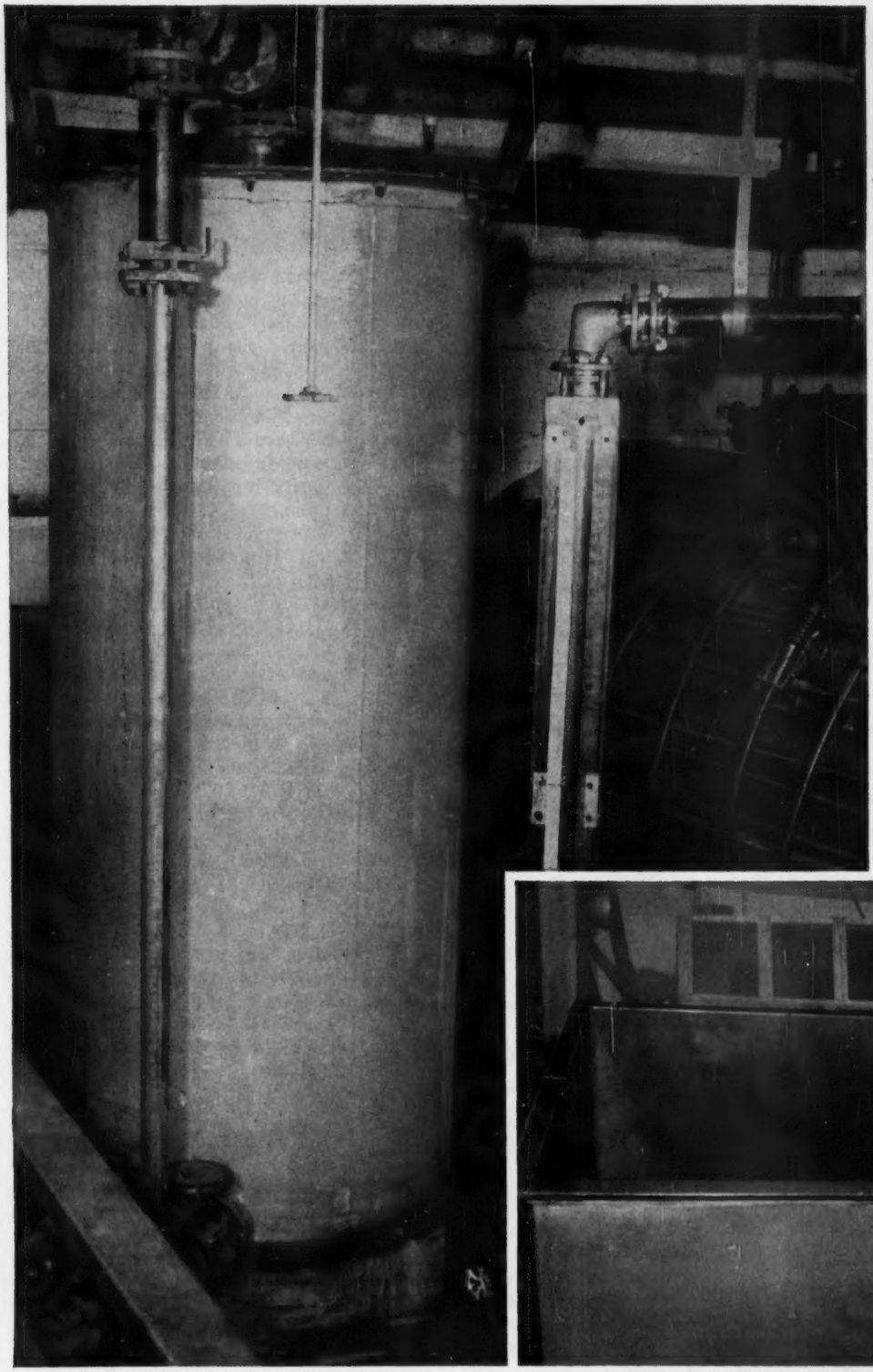


Courtesy, Electro Chemical Engineering Co., Emmaus, Penna.



Courtesy, Mercer Rubber Corporation, Little Ferry, N. J.

TAILORED TO YOUR SPECIFIC NEEDS. The complex shapes shown here demonstrate the versatility of Penton linings applied to low-cost metal substrates for high temperature corrosion resistance. Penton-lined pipe and fittings, valves, meters and pumps can be used in conjunction with such vessels to supply a complete anticorrosion processing system based on Penton.



Courtesy, Electro Chemical Engineering Co., Emmaus, Penna.

USE IT WITH CONFIDENCE. This Penton-lined tank installed in a large East Coast chemical plant has already celebrated its first anniversary of trouble-free service. Used for off-gas condensate, it handles a mixture of 15% HCl and 69% acetic acid in water, at temperatures ranging from 170°F. to 212°F.

Courtesy, Buckley Iron Works, Dorchester, Mass.

ECONOMICALLY APPLIED. Penton linings for large tanks and processing vessels are achieved by the use of adhered sheet ranging in thickness up to 40 mils, applied to low-cost metal substrates with a straightforward adhesive system and conventional gas welding.

Process Industries' Peak Operating Rates

(All dollar figures in millions. Source: National Industrial Conference Board)

	1957 Fixed Capital	Estimated Output at Full Capacity	Actual Peak Output in '57 (at annual rates)	Apparent % of Capacity Utilized at Peak
Chemicals and allied products	$5,524	$15,176	$14,695	97%
Products of petroleum and coal	10,074	22,689	20,614	91%
Pulp, paper and allied products	2,610	5,892	4,909	83%
Rubber and misc. plastics products	558	4,014	3,331	83%
Nonferrous metals	2,200	4,632	3,715	80%
Products of stone, clay and glass	1,892	5,614	4,303	77%
CPI totals	22,858	58,017	51,567	89%
All Manufacturing	51,061	206,295	183,860	89%

Overcapacity: Overstated?

Overcapacity in the chemical process industries is a problem that has been overstated, according to a study reported last week by the National Industrial Conference Board (NICB).

NICB—a nonprofit, fact-finding service supported by private industry, labor unions and other organizations—notes that while excess capacity was virtually nonexistent in manufacturing between 1953 and '55, it began to appear in '56 and reached substantial proportions in many industries at the '57 peak in general business activity.

But in the chemicals and allied products industry, there was only about 3% of idle capacity during that peak period; and for the chemical process industries as a whole, overcapacity of 11% was just equal to the average for all manufacturing industries (*table, above*).

And during the next two years ('58 and '59), according to NICB's computations, the problem of overcapacity was actually diminishing for most industries, taking each industry as a whole. The study does not attempt to cover '60 and '61; but with capital expenditures increasing since '59, it would be reasonable to suppose that overcapacity—as measured by NICB—would be on the rise.

Capital vs. Output: Capacity measures are scarce because of the difficulty of defining capacity, according to the NICB economists who carried out this study. And it's important to observe that they have applied their yardsticks only on an industry-by-industry basis, although presumably the same formula could be applied equally well on a product-by-product basis.

"All too frequently, capacity measures are subjective estimates or judgments," remarks Daniel Creamer, director of NICB's Division of Economic Studies, who authored the report. "NICB has pioneered in developing across-the-board estimates of capacity based on the changing relationships of the value of fixed capital to the value of output after price changes have been eliminated from both. These new estimates of capacity and capacity utilization are now being intensively employed for economic analysis."

More Fixed Assets: A rising capital-to-output ratio means more capital is being used to produce a unit of output at the end of the period than at the beginning; a declining ratio means less capital is being used. Between World War I and '53, the over-all trend was toward use of less capital per unit of output. Between '53 and '57, however, this trend was reversed and more capital was being used per unit of output. Between '57 and '59—a period in which first there was a recession that discouraged capital spending and then a boom that sent production totals shooting upward—there was a general drop in ratios of fixed capital to output.

For producers of chemicals and allied products, the NICB-calculated ratio of fixed capital to output stood at 0.362 in '48, mounted to 0.408 in '53, and then zig-zagged downward to 0.339 in '59. For makers of petroleum and coal products, this ratio was at a high of 0.565 in '48, dropped to 0.444 in '55, and came to 0.486 in '59.

Highest such ratios in the CPI were those for the nonferrous metals producers. Their ratio was at a low of 0.285 in '48, but plant expansion was carried on at a pace much swifter than the industry's gains in production and sales, so that the ratio galloped to a high of 0.592 in '57 before easing slightly to 0.574 in '59. Another process industry with relatively high ratios over the past 12 years was pulp, paper and allied products; its ratio ranged from 0.443 in '55 to 0.532 in '57, then slacked to 0.495 in '59.

Rubber companies achieved the lowest capital-to-output ratios in the CPI: 0.170 in '48, a low of 0.139 in '53, and 0.158 in '59. For makers of stone, clay and glass products, these ratios ranged from a low of 0.337 in '55 to a high of 0.440 in '57, then dipped to 0.376 in '59.

Working Capital Also Up: While those fixed capital ratios were trending upward, there was also a rise in the ratio of working capital to output. Working capital is taken to include cash, notes, accounts receivable, and inventories. Creamer explains this rise as largely due to a disproportionate increase in accounts receivable and inventories, relative to production. "With the transition from a sellers' market to a buyers' market," he comments, "many companies loosened

Progress Report...

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—UCAR butylphenol 4T
—epoxy resins

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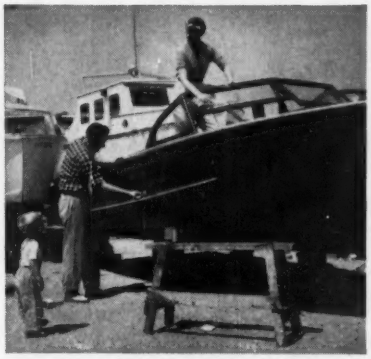
Water-white, liquid 2-methyl-1-butanol is a mixture of the branched chain primary amyl alcohols: 2-methyl-1-butanol and 3-methylbutanol-1 with small amounts of pentanol-1. Typical analysis shows 86% by weight of 2-methyl-1-butanol. Boiling point of the mixture is 130° C. and it sets to glass below −90° C. In water at 20° C., it is 2.2% soluble by weight.

While the primary alcohols in amyl mixtures have similar physical and reaction properties, their pharmacological properties are distinctive. Where isomeric contamination is undesirable, the use of 2-methyl-1-butanol permits preparation of products with controlled flavor, odor, and biological characteristics.

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UCAR butylphenol 4T is the starting material in the production of oil-soluble phenolic and modified phenolic resins used for varnishes and lacquers. Combined with appropriate drying oils, the resins give light-colored coatings that are rapid-drying, tough, and resistant to light, water, acids, and alkalies.

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their credit programs to stimulate sales and thus made more economical use of their greatly enlarged capacities."

This trend, however, was a comparatively moderate one. For chemicals and allied products companies, the ratio of total working capital to output actually declined between '48 and '57—from 0.348 to 0.343. This change included a drop from 0.075 to 0.056 in the ratio of cash to output; a rise from 0.089 to 0.113 in the ratio of accounts receivable to output; and a dip from 0.154 to 0.150 in the ratio of inventories to output.

In the recovery from the '57-'58 recession, expenditures on structures, land and equipment scarcely exceeded the amount of capital used up in the form of depreciation and obsolescence, Creamer continues. Thus, the expansion received no important assistance from net investment in structures, land and equipment in manufacturing, but instead utilized some of the excess capacity created in the preceding boom.

Rented structures and equipment in manufacturing were relatively more important at the end of the '50s than at the beginning of that decade; but rented structures and equipment accounted for only a small percentage of total fixed capital.

Cover for NASA Jobs

Contractors doing business with the National Aeronautics and Space Administration can expect to get indemnity coverage for special projects. Favorable Congressional action is now a sure bet. But just how much protection they'll actually get is still unsettled.

On July 11 the House Committee on Science and Astronautics voted in favor of granting NASA contractors insurance patterned after that provided by the Dept. of Defense. This pretty much assumes unlimited liability on the part of the government for contractors engaged in extra-hazardous research and development projects.

Contractors would be allowed to buy the maximum amount of private coverage offered with premiums written off at government expense. Damages incurred in excess of the private coverage would be paid for by the government.

The Senate, however, favors limiting NASA indemnity coverage to $500 million. The same amount is provided for Atomic Energy Commission contractors. The space agency originally proposed this limit to the Senate.

The guessing in Washington is that the unlimited coverage proposed by the House committee will be adopted. No major opposition is expected from the Senate or NASA.

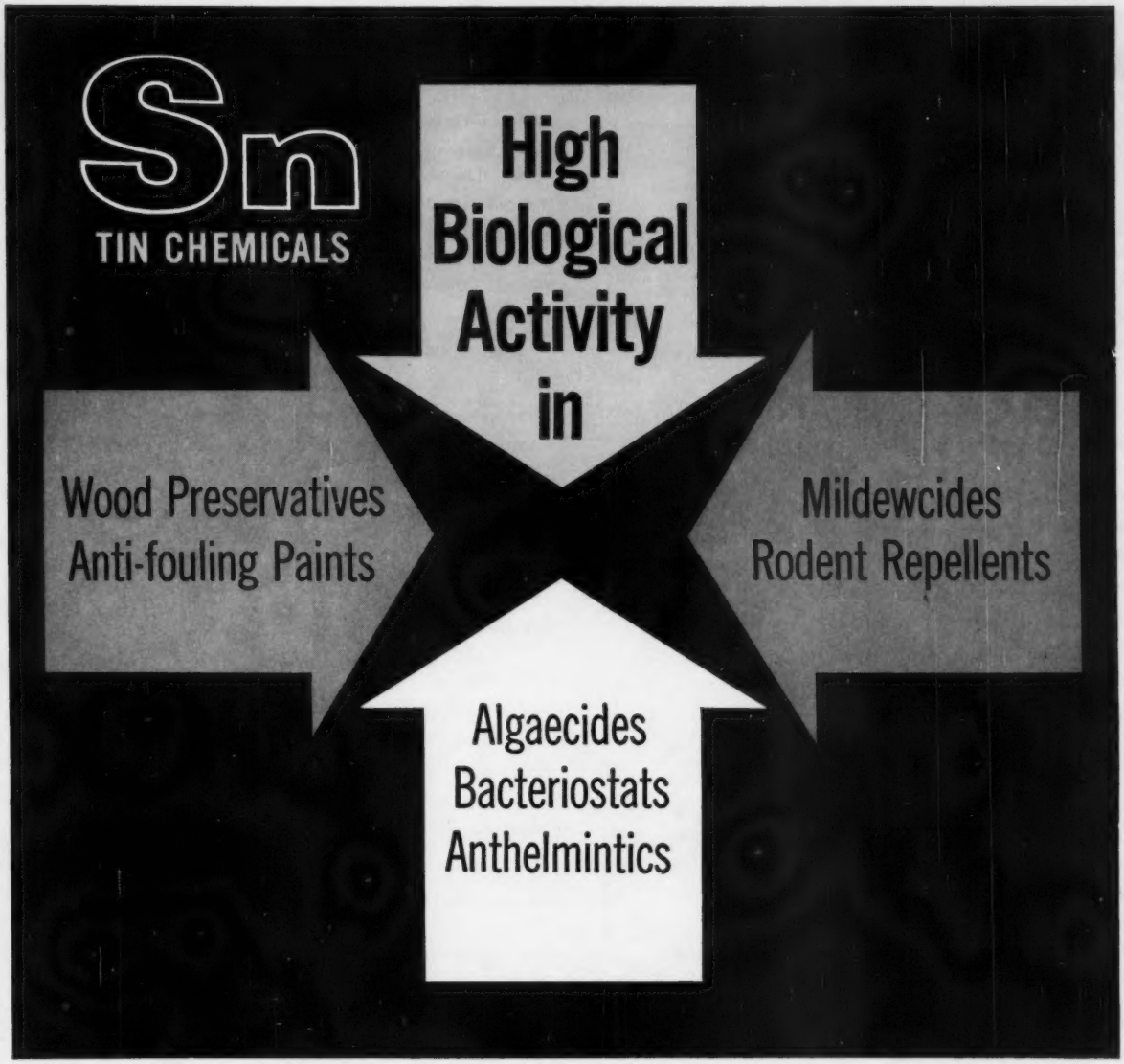
LABOR

Settlements: International Paper Co. has signed a one-year contract with the three unions representing the majority of the 13,000 employees of the company's Southern Kraft Division mills. The new agreement calls for improvements in the company's group insurance program, increased benefits under the retirement plan, and a 3½¢/hour across-the-board wage increase. The previous minimum base pay rate was $1.92/hour. Signing unions were United Papermakers and Paperworkers, International Brotherhood of Pulp, Sulphite and Paper Mill Workers, and International Brotherhood of Electrical Workers.

- Kimberly-Clark Corp. has reached a one-year agreement with United Mine Workers Local 12970, Niagara Falls. The contract provides hourly wage hikes of 5 to 11¢, liberalized vacation policies, revision of pension and insurance plans.
- General Aniline & Film Corp.'s Ozalid Products Division and Lodge 1807 of the International Assn. of Machinists have wrapped up a new two-year contract. It gives employees a 13¢/hour wage increase over the period, an extra paid holiday (Good Friday), improved seniority procedures, a new, improved vacation plan, and a new comprehensive medical insurance plan that provides up to $10,000 coverage for each member and his family.

LEGAL

Insecticide Suit: Virginia Chemicals & Smelting Co. (West Norfolk, Va.) faces a $375,000 suit based on the charge that the company's negligence resulted in its insecticide product, Lethalaine G-64, killing a Cleveland tomato grower. The suit, brought by the executrix and administrator of the grower's estate, asserts he used the insecticide, which allegedly contains Phosdrin, the day before he became violently ill. It charges that the



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illness and death were caused by the defendant's "breach of express or implied warranties to the effect that the insecticide and/or its components was reasonably safe," and by the company's "negligence in developing, manufacturing, marketing, distributing, and selling such insecticide and/or its components including . . . defendant's failure to give proper instructions for use . . . and properly warn of the dangerous propensities . . ." The suit was filed in the circuit court of Norfolk County, Portsmouth.

•

"Fair Trade" Injunction: Abbott Laboratories has won a temporary "fair trade" injunction in the U.S. district court (Maryland) against G.E.M., Inc., restraining the latter from selling and advertising Abbott products in Hyattsville at less-than-fair-trade prices. Abbott is reportedly the first manufacturer to obtain such an injunction against G.E.M. in Maryland.

KEY CHANGES

John T. Castles to general manager, General Electric's Chemical Materials Dept. (Pittsfield, Mass.).

Richard H. Dillinger to manager of starch sales, Morningstar-Paisley Inc. (New York).

James W. L. Monkman to director of plastic sales, Polymers Dept., Hercules Powder Co. (Wilmington, Del.).

John B. Cornwell, Jr., to director of technical sales, and **Robert M. Hicklin** to production manager, Fiber Division, Reeves Bros. (New York).

Robert P. Barnett, Robert J. Reilly, Walter H. C. Rueggeberg, W. Spencer Thompson to vice-presidents, and **Thomas J. Laffey, Jr.,** to secretary, Atlas Chemical Industries (Wilmington, Del.).

Henry W. Kingsbery to superintendent of technical services, **Harry E. Gardiner** to chief engineer, **Howard L. Anderson** to chief planner, Neches Butane Products Co. (Port Neches, Tex.).

M. L. Rosenberg to vice-president and general manager, Neches Butane Products Co. (Port Neches, Tex.), succeeding W. H. Hoffman, president, retired.

Tracers

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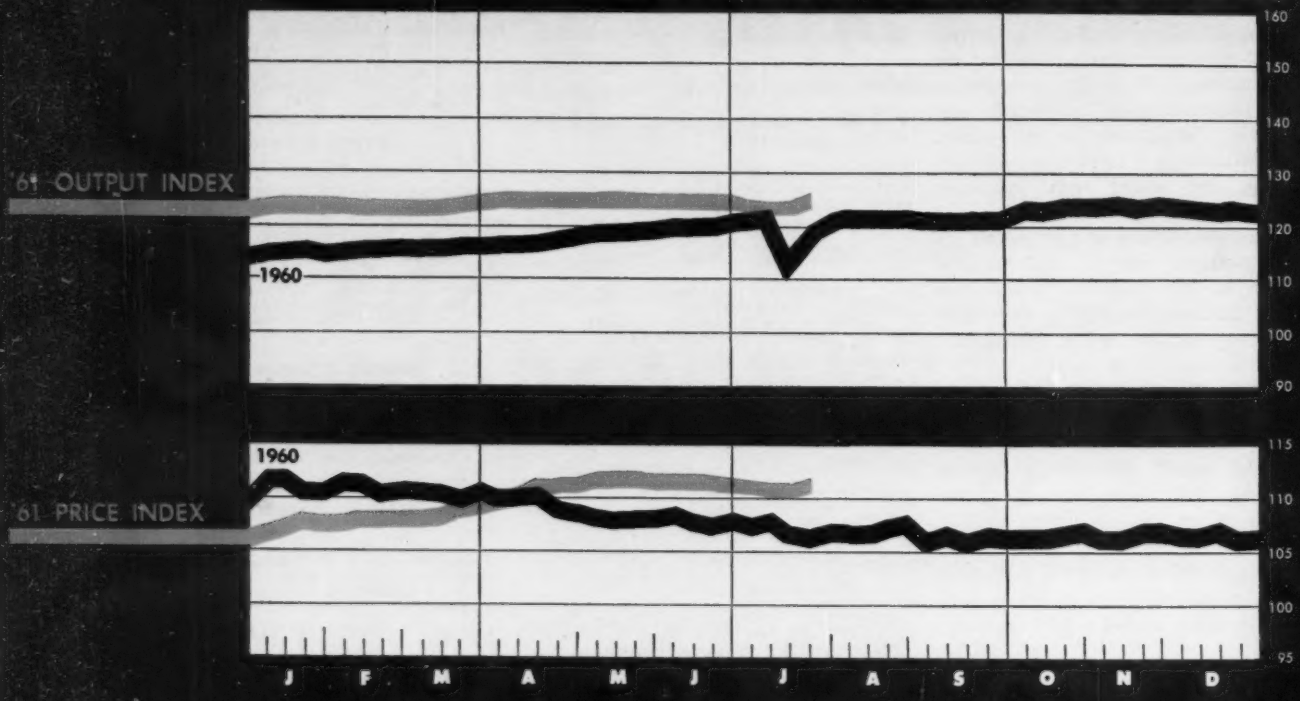
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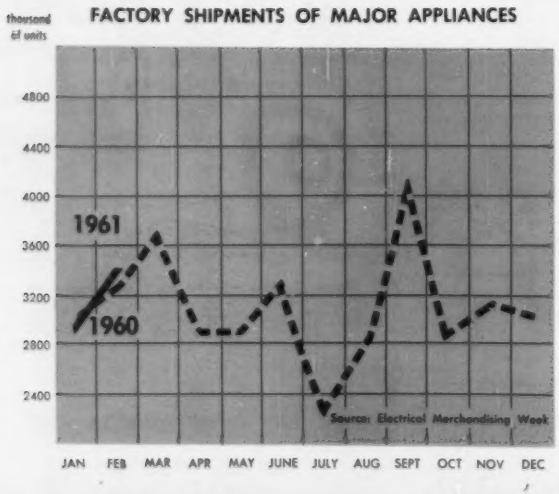
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WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	124.5	123.4	122.5
Chemical Week wholesale price index (1947=100)	111.8	110.8	106.9
Stock price index (12 firms, Standard & Poor's)	53.08	53.24	52.87
Steel ingot output (thousand tons)	1,779	1,925	1,203
Electric power (million kilowatt-hours)	14,133	15,183	13,408
Crude oil and condensate (daily av., thousand bbls.)	6,969	6,888	6,831

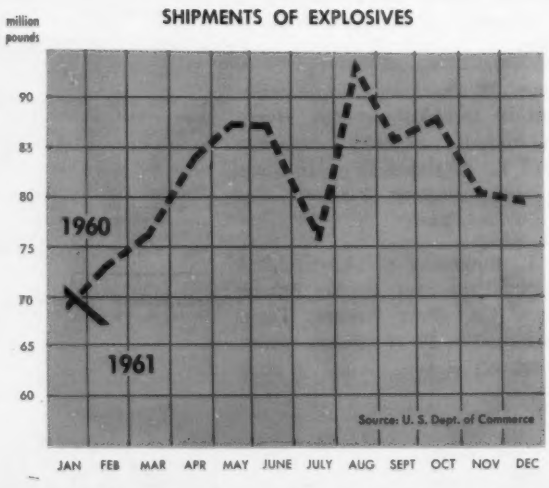
EMPLOYMENT INDICATORS (thousands)	Latest Month	Preceding Month	Year Ago
All manufacturing	15,683	15,529	16,348
Nondurable goods	6,688	6,674	6,832
Chemicals and allied products	881.7	880.7	879.6
Paper and allied products	546.0	546.0	562.7
Rubber products	243.2	239.5	257.1
Petroleum and coal products	218.9	217.3	231.9

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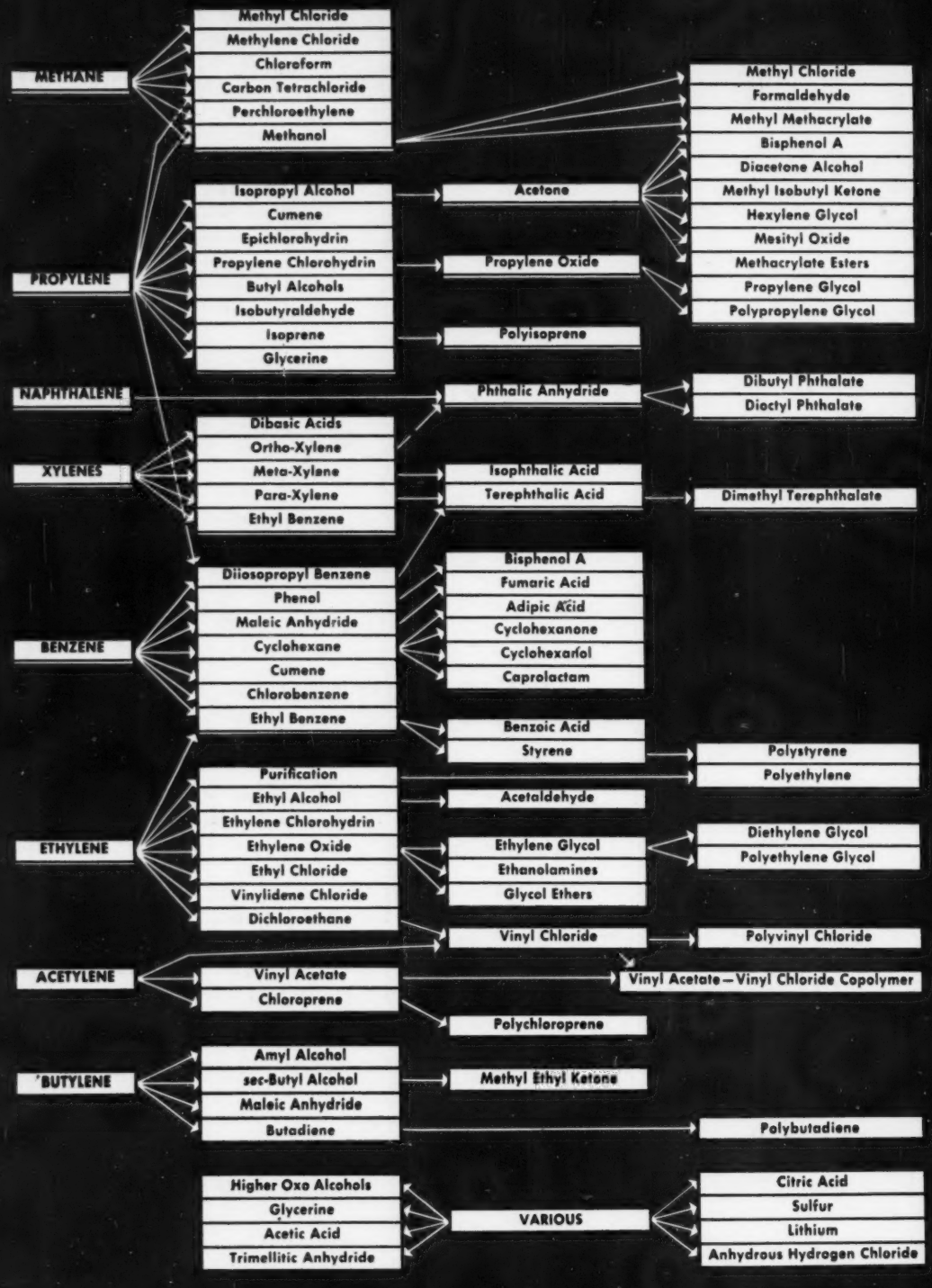
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